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MEDICAL JOURNAL OF AUSTRALIA



Vol. II.—14TH YEAR.

SYDNEY: SATURDAY, NOVEMBER 19, 1927.

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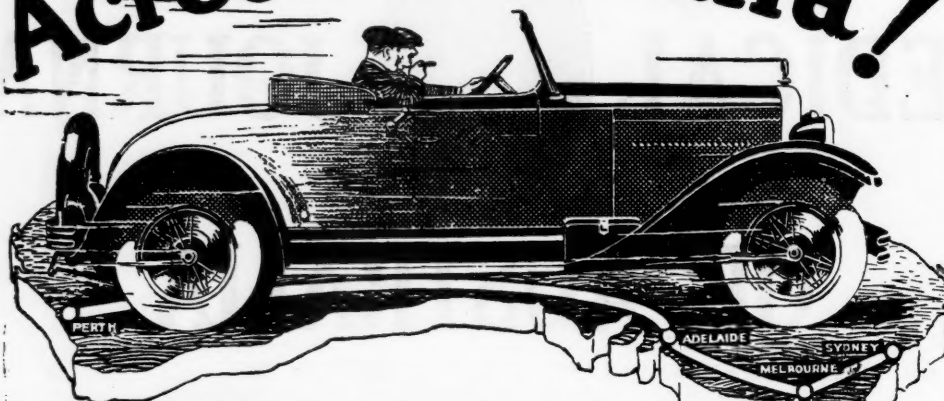
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BLOOD FORMATION: A STUDY OF MYELOGENESIS.

By C. WITHERINGTON STUMP, M.D., D.Sc.,
Associate Professor of Anatomy, University of Sydney.

Introduction.

The problem of blood formation despite the copious literature on the subject must still be considered *sub judice*. It is not within the scope of this paper to discuss the detail of experimental and morphological work which has been done in the various schools of hæmatology. Although in recent years experimental methods have replaced the traditions of the formal histologists particularly of the Pappenheim and Ehrlich schools, no general agreement has been reached regarding the genetic relationship of the blood cells. Especially is this so with regard to the stem blood cell, a cell which has oscillated hypothetically from a single entity equivalent for all blood cells, to separate entities, morphologically distinct with valencies limited to either erythropoiesis or granulopoiesis. Under the stress of these differences of opinion two schools of hæmatologists have arisen, the monophyletic and polyphyletic. The former postulated the existence of a multipotent parent cell from which the white cells and the red cells were derived. The latter maintained the existence of separate and distinct stem cells for the erythocytic and granulocytic lines of development.

The works of Dantschakoff on avian myelogenesis and that of Maximow on mammalian hæmatogenesis performed with a more critical technique than was hitherto employed, strengthened the case for the monophyletic school.

Dantschakoff's experimental studies with adult spleen grafted on the allantois of a chick embryo, certainly establish for the granulocytes a definite parent cell the identity of which is satisfactory as far as histological criteria are concerned. Experimental evidence of erythropoietic potencies in the same cell is still lacking. More recently Sabin, Doan and Cunningham employing supravital technique, have produced evidence of a reticular specific stem cell for the monocytes, lymphocytes and granulocytes. They derive the reds from endothelium, intravascularly. This work advances the controversy of the two schools of hæmatologists to a position where the issues are clear. The problems still to be solved revolve around the identity of the reticular cells, the relationship of endothelial cells to reticular cells and the limits of their potencies in hæmatogenesis. Aschoff, Landau and Kiyono in 1913 grouped these cells as the reticulo-endothelial system. Direct deposits of differentiating mesenchyme, these cells may be regarded as retaining the potencies of mesenchyme for any line of development. Undue confusion has arisen in the study of this system by a confused terminology. This is equally true as regards the study of blood formation. Sachs⁽¹⁾ has essayed a cursory *résumé* of the work done on the reticular endothelial system

especially from a pathological standpoint. The study of mesenchymal mechanism involves fundamental problems of cell valencies and biochemical activities in growth processes and metabolic reactions. A fuller knowledge of cell physiology in relation to these studies is ceaselessly forthcoming and it is only in correlation with such work that morphological investigations assume any significance.

Blood formation first occurs in embryonic life in the mesenchyme of the allantoic stalk and the entodermic vesicle. Later the embryonic mesoderm gives rise to blood vessels and blood cells of the red series and eventually the extra embryonic vessels connect with vessels both of the chorion and of the embryo. The liver and splenic *Anlagen* later become the foci of hæmapoiesis for the total embryo, but as the cartilaginous skeleton is replaced by bone, new and permanent blood cell foci arise from the osteogenic mesenchyme, these constituting the bone marrow. This mesenchyme forms a singularly favourable site for the study of hæmatogenesis in that its potencies are mainly limited to blood formation and further, observation can be made over an area of tissue which at one end is completely undifferentiated and free from other cell entities and from which a wake of maturing cells is deposited.

Although recognized as the most important of the blood cell factories, the bone marrow in its developmental stages has received little attention from the multitude of workers on hæmatology. This is the more remarkable when the divergent views on the cytogenetic relationships of blood cells and marrow cells are considered.

The processes whereby living cells undergo developmental changes, both morphological and functional, are represented in fixed preparation by phases which only when correlated indicate the path along which development was proceeding at the moment of death. This is constantly to be borne in mind in the study of hæmapoiesis, where the morphological values alter so completely in cells very closely related.

In order to render the statement of the changes that occur in various cells concisely and clearly and incidentally to avoid the involved nomenclature employed in the literature, no terms will be used to denote cells which have been interrupted during a specialized maturation. No benefit is derived from such a procedure and indeed the mere fact of interposing a name tends to falsify the conception of a process, the essential feature of which is interrupted development.

When a mesenchyme cell changes into an osteoblast many transition phases can be demonstrated with fixed preparations, none of which is stable even to the extent of hesitating to undergo mitosis. In the formation of blood cells both in the white and red blood cell series transition forms derived from the stem blood cell appear to act otherwise. Proliferation of the transition forms constitutes one of the most striking features in both series; moreover, in the early stages of development of these

blood cells stable forms arise which may proceed to maturation at any time or on the other hand senility and death may supervene. One stem blood cell by division of its derivatives may give rise to an unlimited number of blood cells, the complete evolution of which by virtue of the hesitation and diversity of transition forms may be spread over the entire existence of the organism, the initial change in the stem blood cell having occurred in embryonic life. Fully developed marrow consists mainly of the hesitating transition forms and their derivatives. The stem blood cells never numerous in the sense that the transition forms are numerous, even in early embryonic life, are not a prevalent type in full grown marrow. Sometimes not one can be demonstrated in an entire field. For these reasons it is abundantly clear that the total changes that occur in the evolution of the blood cells may never be encountered in preparations of marrow itself.

Of previous investigators the results although obtained with a different technique correspond more closely with those of Maximow⁽²⁾ than the results of any other observer. Many of the conclusions are not in accordance with much that has hitherto had current acceptance. To keep within the limits of a simple record these issues will not be raised; to do so would involve a redundant survey of the literature, an interminable discussion on technique and the unravelling of an unwieldy terminology which has passed beyond the limits of scientific application. In this last respect it is sufficiently significant to record that Grüner⁽³⁾ in his glossary of hæmatological terms has in one case eighty odd synonyms for a single cell. It is the special aim here to describe the morphological values of the cell entities involved in myelogenesis and to define their genetic relationships.

The Endothelium.

Under the heading of endothelium it is proposed to trace the formation of the capillary endothelium of the blood vessels of bone and marrow in order to establish the relationship of the cell of this tissue with the other specialized connective tissue elements that also develop.

The earliest sign of capillary formation is observed in the syncytial masses invading the hypertrophic cartilage zone. This formation continues with the advance of the mesenchyme at the ossification line and may be studied there at any stage in bone growth (Stump⁽⁴⁾). Transverse sections made at the ossification line through the mesenchyme tissue show in the plasm of the syncytium apparent vacuoles, the larger ones occasionally contain red blood corpuscles, but in this region the content is usually coagulated fluid. Traced in serial section they are seen to be distinct tubes continuous centrally with formed capillaries. The lumina appear to enlarge at the expense of the syncytial cells, the nuclei of which are pushed aside until they ultimately form the walls of capillaries. No change in structure of these nuclei occurs other than a gradual flattening. In this way the endothelial cells arise *in situ* from the mesenchyme. At no

stage in their development are they discrete nor have they been observed to play any further rôle either of division or separation. Even in later stages when the adjacent syncytial cells separate to form a reticulum of stroma cells, no evidence of further differentiation has been discovered. It is abundantly clear that the endothelial cells are formed without specialization and segregation and that proximity to the lumina which arise, decides their subsequent function as cells of a limiting membrane to the blood stream. As the adjacent mesenchyme cells loosen during the isolation and mobilization of the osteoblasts and stem blood cells, the capillaries come to lie in or near the centre of the intertrabecular areas. Later the lumina increase in size and sinusoid blood spaces are formed, without which the marrow tissue develops. Still later occasional small arteries are formed, the indifferent stroma cells aggregating by division to form the plain muscle fibres.

The Development of the Stem Blood Cells.

The use of the term stem blood cell is admittedly questionable, for not only does it give rise to the antecedents of the blood cells, but also it is the parent cell of the megakaryocytes. However, these lines of development appear to be the limits of its cytogenetic potential in physiological processes of growth, so no confusion can arise with regard to its present application.

This cell develops by a direct maturation of indifferent mesenchyme cells in a somewhat similar manner to the osteoblast. The latter cells, however, develop first and it is only when the mesenchyme has delivered its quota of osteoblasts to the chondro-mucin trabeculae that the stem blood cells begin to make their appearance. They develop in the extravascular mesenchyme, eventually freeing themselves and in this way the remaining indifferent mesenchyme cells assume the form of a reticulum, the stem blood cells having mobilized themselves freely in the interstices of a meshwork.

Thus a zone of reticular tissue is formed in the wake of the syncytial mesenchyme in which capillaries occupy the central positions and epithelial like layers of osteoblasts line the calcified chondro-mucin trabeculae. Occupying the intervals between the capillaries and the bone forming cells, the still indifferent mesenchyme cells now sparsely scattered form a loose reticulum giving support to the capillaries and enfolding in a network the stem blood cells. The subsequent fate of these reticular cells will be considered later. The point of interest at this stage is that the stem blood cell is a pre-eminent feature of the histological picture. This reticular zone is always present, immediately central to the syncytium at the ossification line and affords every opportunity for the study of the stem blood cell before it moves along the paths of further development. Its identity can here be established without qualification, because its derivatives have not yet arisen to confuse its genetic kinship, moreover by virtue of its priority of development both in time and manner, it definitely establishes its precedence in relation to the other myeloid elements.

In no other part of the developing bone is it so prevalent and even in this area it is not as numerous as would be expected, when the myriads of cells which arise from it, are estimated. Its development has been described as a process of maturation of an indifferent mesenchyme cell. During its evolution no division has been observed in any phase. The cytomorphosis is characteristic and peculiar to the cell, especially the changes that occur in the nucleus. From the pale vesicular nucleus of the mesenchyme cell, a deeply basophile nucleus arises, somewhat larger in size. The chromatin increases in amount and aggregates to form a large purplish-violet staining, chromatin body, irregular in shape and indifferent in its position. Sometimes it lies near the nuclear membrane and occasionally it appears to be fused with it, in which case it exerts an influence on the nuclear membrane so that the nucleus appears to be partly folded on itself. Occasionally it is seen as two, three, or four partially separated masses connected by means of stout chromatic strands. Other small granules of chromatin are usually seen studded throughout the nucleus, especially around the periphery of the nuclear membrane. Changes in the cytoplasm develop *pari passu* with the nuclear metamorphosis, the most striking being the intense basophilia. This is apparent before the cell is isolated. The final mobilization is associated with a general contraction of the cell body, so that when finally rounded off it lies freely in a fluid space, surrounded by the still indifferent connective tissue cells which are now rapidly assuming the reticular formation.

The mature stem blood cell is highly amœboid, hence in sections its size and shape are liable to assume wide variations. Occasionally small club-shaped pseudopodia project from the entire circumference of the cell.

Similar processes are seen in megakaryocytes both in smear and bulk preparation and are supposed by some observers (Wright⁽⁵⁾, Woodcock⁽⁶⁾ and others) to be associated with the formation of blood platelets.

It is non-granular inasmuch as it possesses no special granules. The fact that it may or may not contain azure granules is unimportant, as these are not specific to any cell of the blood series. In the mature cell there is little difference in the staining reaction of nucleus and cytoplasm, both are intensely basophilic. Senile types, however, manifest a diminished intensity of basophilia. Advanced senile types contain a greatly swollen nucleus and are orthochromatic in staining reaction. These large pale degenerating cells die in karyorrhexis. Protean in form, actively amœboid, capable of ageing rapidly, such gross morphological factors as size, shape and staining reaction are valueless in establishing the identity of the cell or in fact of any cell whose functions are associated with such wide activities. The characteristic structure of the nucleus and the absence of special granules in an almost homogeneous cytoplasm are the features which distinguish the stem blood cell from all other types. Romanowsky's stain and its modifications,

such as Jenner's and Leishman's, fail in the demonstration of its structure and for this reason alone are of little value in hæmatological cytology.

A well defined attraction sphere makes its appearance during the development of the cell, showing up as a pale area, by contrast during the basophilic changes in the cytoplasm. It lies close to the nuclear membrane which is always indented at this site. Neither the indentation of the nucleus nor the attraction sphere is seen unless orientated in the cell in the plane of section. It is apparent that the different appearances assumed by the cell according to the above description offer no just grounds for inferring that definite morphological variants occur. Nor is there, as far as has been ascertained, any reason to suppose as the dualists do, that because of the subsequent divergent cytogenetic activities there must be structural differences. The fact that a fertilized ovum is totipotent for every cell of the organism, is sufficient to permit the assumption that the stem blood cell is multipotent for all cells of blood and bone marrow. It is of interest to record that no appearances have been observed that would lead to the supposition that the stem blood cells arise from the endothelium. Although they may be found in close proximity to the capillary walls, on no occasion have they been observed within the lumina nor have endothelial cells been seen tending to changes that the mesenchyme cell undergoes during its maturation into a stem blood cell.

The Genesis of Red Blood Cells.

The most prevalent process not only in myelogenesis, but also in fully developed marrow is the development of red blood corpuscles.

Although numerous accounts are given in the literature unanimity has not been attained and detailed work is singularly lacking on the earliest cells of the series. The tissue undergoing hæmopoiesis central to the reticular zone (already referred to in the previous paragraph) affords the most favourable site for this study because of the loose arrangement of the cell elements. Myelogenesis proceeds so rapidly—a single stem blood cell gives rise to hundreds of derivatives within a very short period of growth—that oblique sections are necessary to expose the greatest area of the intertrabecular spaces, a procedure which has the effect of apparently slowing down the process by extending the zone of transition and at the same time rendering for observation the maximum number of cells. In such a section the great numerical increase in the myeloid elements is shown to occur in focal areas which arise in relation to the scattered stem blood cells.

The stem blood cells form the nidus of the hæmopoietic foci, all gradations occurring from single cells through small isolated clusters up to large focal areas which eventually coalesce. This focal arrangement is most characteristic of the early embryonic marrow and is the result of extensive proliferation in the descendants of the parent

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cells. It is impossible to decide from fixed preparations whether a stem blood cell can mature directly into a fully formed erythrocyte (heteroplastic development). The power of division evidenced by mitotic figures in the various derivatives is indicative of homoplastic development whereby the terminal stages alone undergo simple maturation without proliferation. Certainly the stem blood cells are so few that heteroplastic development would not account for more than a tithe of the myriads of myeloid elements that comprise the developed marrow tissue. The outstanding feature of erythropoiesis is the extreme cytomorphosis that occurs. Whether the changes take place during division or whether advance in the series is made by the resting forms is not easy to decide. Such issues can be settled only by experiment with living preparations. As in the stem blood cell senile changes may arise in any stage of development. The above indicates a reserve of developmental potential which has been amply demonstrated clinically, whereby urgent physiological demands and pathological interruptions can be rapidly met.

Structural changes in the nucleus of the stem blood cell indicate that the path of red cell development has been entered.

The chromatin mass fragments and bars or nodules of chromatin scatter themselves irregularly throughout the nucleoplasm. At the same time there is a slight reduction in the size of the cell mass. Though still amœboid these cells are usually round or oval in shape and the nucleus usually occupies a central position. Further changes in the chromatin disposition ensue, which are now seen as aggregations around the nuclear membrane. Later these aggregations form irregular bars which project towards the centre. During these changes no alteration in the cytoplasm occurs other than a reduction in amount.

Cells of the red series at this stage bear no resemblance to any other cell types. They are non-granular and the chromatin arrangement is specific. The subsequent cytomorphosis is associated with the further changes in the nucleus, the chromatin bars assuming the radial arrangement which has evoked the description of "wheel nucleus." Alternating bars of parachromatin and chromatin passing from the membrane to the centre give this appearance when the cell is cut through its greatest diameter. Whilst these nuclear changes are taking place, the cytoplasm becomes less basophilic and more homogeneous. Ultimately the cytoplasm is orthochromatic and then gradually as the haemoglobin content rises, becomes definitely acidophile. The further changes resulting in the formation of the small nucleated red cell are well known. With the reduction in size of the nucleus the chromatin bars become more closely approximated and the parachromatin is no longer apparent. The fate of the nucleus is a problem still freely disputed.

Karyorrhexis, extrusion, disintegration and solution have all in turn been put forward as possible terminations. Frequently the nucleus assumes an eccentric position in the cell body, so that an exten-

sive zone of nuclear membrane is thinly bounded by cytoplasm. Sections made through the plane of this eccentric nuclear protrusion give the appearance of a naked nucleus. Further extreme eccentricity may be taken as evidence of impending extrusion. However, these appearances are inadequate evidence for the assumption of such a fate as they are only occasional.

The prevalent appearances have led to the conclusion that disintegration and solution following pyknotic degeneration is the fate of the nucleus. The densely staining chromatin mass becomes reduced in size and gradually loses its basophilia, the nuclear membrane becomes crenated and eventually an indistinct, slightly basophilic, irregular structure is all that remains. Occasionally the Cabot ring formation is seen in the last stages which are apparently very rapid once the degenerating chromatin loses its basophilic reaction.

When the stem blood cell embarks on the development of the red series the structural modifications described definitely separate cells of this group from all other types. The expediency of introducing terms to definite stages in the evolution of the erythrocyte is questionable, for by so doing stress is laid on the more characteristic transition phases which in reality are no more significant in the process than those left unnamed.

The way in which the red blood cells gain the circulation is a matter of interest especially in view of the present findings where the erythropoietic foci appear to be definitely extravascular. The stroma of the myeloid foci is a branched reticulum in which capillaries are suspended. As the free cells increase the meshes of the reticulum expand. This distension coalesces the spaces of the meshwork. The endothelial cells of the defined capillaries are in protoplasmic continuity with the reticular cells of the stroma. There is abundant evidence of capillary lumina showing confluence with the interstices of the reticulum. The hypothesis is therefore advanced that the reticulum forms potential sinusoids which can become confluent with the early formed capillaries, the reticular cells bounding such sinusoids then assuming an endothelial function. In this manner the formed blood elements gain the circulation. The meshwork of the myeloid foci can be regarded as potential sinusoids.

The Granulocytes.

Under the heading granulocytes the development of the cells with specific granules which mature into blood leucocytes will be considered. The specific granules vary in character clinically and morphologically in different animals and are usually referred to in terms of their staining reactions. In rabbits and guinea pigs the three types are: the special granules or pseudoeosinophile, true eosinophile and basophile or mast cell granules. The first named are the most numerous and probably homologous with the neutrophile granules in man. The question of the specificity of these granules as definite structural entities has been settled elsewhere. Downey's work⁽⁸⁾ on guinea pigs has been

verified by the methods that he employed with Ehrlich's three colour stain, eosin, inulin and aurantia. With the technique employed in this work it was not possible to demonstrate the mast cell granules in rabbits owing to their extreme solubility in the watery fixative used. The mast cell granules in guinea pigs are not soluble to the same extent and are clearly demonstrable, especially if the tissue is immersed in a decalcifying solution such as nitric acid and bichromate.

Maximow⁽²⁾ has dealt exhaustively with the development of these cells and it is mainly with the idea of confirmation that the processes are here set forth in detail although one or two issues such as a common primitive granular form for eosinophile and pseudoeosinophile have not been sustained. This point will be again raised in dealing with the typical early true eosinophile granules. In order to avoid repetition it is proposed to describe the special granular cell development in detail and then later to refer to the other types, only inasmuch as points of special interest arise.

The first granular cells to appear arise in the central fringe of the reticular zone, but they are so few that they are apt to escape observation. Attention was first directed to them by the discovery of a cluster containing five, lying in the reticular zone amidst a group of stem blood cells and undifferentiated reticular cells. They were fully matured polymorphonuclear leucocytes of the eosinophile type, with highly refractile, coarse, rod shaped granules. Further investigation revealed very occasionally these mature types, both of the eosinophile and special granular cell series occurring in the same zone. Earlier forms were also encountered and this has led to the assumption that they arise rapidly by heteroplastic maturation directly from the stem blood cells, a form of development which is subsequently superseded by homoplastic evolution. Dantschakoff⁽⁷⁾ has described a similar phenomenon in birds and Maximow⁽²⁾ records the same thing in rabbits and guinea pigs. The homoplastic development occurs first of all in the focal zones of erythropoiesis where the special granular cells appear singly most frequently, in pairs occasionally and in groups of three and four very rarely. They lie extravascularly amidst the other tissue elements. No special type of stem blood cell can be associated with the granulocyte path of development. The granules at first appear slowly, so that it is not unusual to find a cell with all the appearances of a stem blood cell with one, two, three or four granules, lying around the outer periphery of the attraction sphere. At this stage no structural changes take place in the nucleus nor is the general staining reaction of the cell altered. The presence of the granules is the sole indication that a new line of development has been started. These special granules when stained assume a deep red, are round or slightly oval in shape, varying very little in size, the smaller ones are apparently the most recently developed. Increase in the number of granules marks the further development of the cell, division occurring at any stage. Maximow⁽²⁾ puts forward the hypo-

thesis that granulation first occurs during the last stages of mitosis in a stem blood cell. In support of this he says that early granular cells are never seen in the early mitotic figures; that is in prophase but always in telophase. Hence he decides that granules appear at the end of karyokinesis itself and that therefore the qualitative changes connected with this line of differentiation are intimately bound up with the process of mitotic division. The finding of single cells quite isolated showing as few as one to four granules, renders this point of view untenable; nor does the same theory appear to be applicable to the initial stages of erythropoiesis on the same grounds.

With regard to the megakaryocyte, Maximow admits that in this case it is difficult to decide when a stem blood cell enters the path of megakaryocyte development. It will be shown later that this cell matures without division interrupting the process. The arrangement of the granules appears to occur around the attraction sphere in the form of a cone. With the use of panchromatic plates and Wratten filters the granules can be cut out and the position of the sphere indicated in relation to the disposition of the granules. The further changes that occur after a full complement of granules develop are seen in staining reactions and nuclear form and structure. The early granulocytes are large cells, if anything slightly larger than a stem blood cell, but thereafter the subsequent changes are associated with a gradual reduction in size until the polymorphonuclear stage is reached.

The cytoplasm of the early type is deeply basophile but towards the end of granulation it gradually becomes orthochromatic tending to acidophilia. This change also occurs first of all in the vicinity of the attraction sphere, gradually extending throughout the cell plasma. The chromatin mass of the nucleus also becomes paler and at the same time appears to contract forming a rounded body. The changes in the shape of the nucleus are well known, passing throughout the various forms which have merited recognition by numerous appellations. Again these terms fail to assist in any understanding of the process, because they sharply define types which are variable and in constant fluctuation. Certainly the nucleus is at one time reniform, another sausage shaped, then lobulated and finally polymorphous, but in living tissue the transition is continuous. At the reniform stage the chromatin body fragments and forms smaller chromatin masses which eventually appear as nucleolar-like structures, one in each lobulation of the mature nucleus.

After the nucleus lobulates, division is no longer possible and for the most part it is only the early types which divide. During the whole process of the formation of special granular leucocytes no change occurs in the nature of the granules. They are simply endogenous bodies arising from the cytoplasm as a result of metabolic changes.

In intrauterine life in rabbits very few mature special leucocytes arise. The homoplastic method of development is a slow process and although the granulocytes appear very early, the mature forms

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are not developed in large number until the marrow is well advanced.

In rabbits the true eosinophile granulocytes arise in a similar way to the special granulocytes, but in this type the granules themselves are atypical in the early stages, but at the same time quite distinctive. Maximow⁽²⁾ is inclined to the belief that in embryonic marrow there is a common granular cell form, for both eosinophile and special granular cells, although he admits that later in development the two groups have separate origins. The technique here employed by no means suggests such an interpretation.

The early forms of the true eosinophile granulocytes develop granules of a larger size with quite different staining reaction, varying in colour from a pale violet to a bright red. Downey⁽⁸⁾ has demonstrated that the basophile quota in these cells form the immature granules and that maturation is associated with increased acidophilia. Certainly these cells are rare in early myelogenesis and for that reason are difficult to study, but the granules are quite specific even in the earliest stage. Later the granules become more highly refractile and appear to lie in small rounded pale areas of cytoplasm. Eventually they elongate and become rod shaped, some of them straight, others slightly curved. With regard to the mast leucocytes there is little to add to what has hitherto been said regarding the other types. A technique is still wanted which will demonstrate them in bulk tissue in rabbits in such a way that they stand comparison with the other granulocytes in cytological detail. In guinea pigs they develop in late foetal life and are much larger than the eosinophile and special granules. In every way they evince the same changes in development which have been described for the special granulocyte. In embryonic myelogenesis in guinea pigs, the mast cell of histogenic type is freely encountered. Towards the end of foetal life it disappears. It bears no relation to the hæmatogeneous type which forms the mast leucocyte.

Smear preparations fixed in osmic acid vapour and stained with Mallory's triple connective tissue stain⁽⁹⁾ affords a very satisfactory technique for the study of this cell. There is nothing to add to what is already known regarding the nature of this cell in guinea pigs. Downey's work has been confirmed both with his own technique and the present method.

The Megakaryocyte.

The origin of the megakaryocyte is more easily observed than any other of the myeloid cells, hence it is difficult to conceive how opposed statements have arisen. Jordan⁽¹⁰⁾ reviews the literature and deals with the various origins and functions ascribed to this cell. The work of Wright perhaps has attracted more attention in this connexion than that of most observers. He derives the megakaryocyte from the endothelium, a point of view not upheld and regards it as the source of blood platelets supported by Bunting,⁽¹¹⁾ Jordan,⁽¹⁰⁾ Woodcock⁽⁶⁾ and others. This appears to be an attractive hypothesis, but has yet to be proved. Certainly these cells are peculiar to mammalian hæmopoietic foci,

occurring in the embryonic liver, spleen and bone marrow. That they may have some philogenetic relation to the thrombocytes of the lower vertebrates has yet to be established. In the compact marrow they are frequently seen lying close to the endothelial sinuses, with club shaped pseudopodia bulging into the lumen and also into the adjacent myeloid tissue. It is suggested by the above observers, because of similarity in staining reactions, that these protoplasmic buds separate to form the blood platelets. It has been shown above that the stem blood cell develops in certain amœboid phases similar pseudopodia, but in neither of these cells has the separation of these protoplasmic projections been observed. Phagocytosis and erythropoiesis are functions that have been ascribed to the megakaryocyte, neither of which has been observed during the course of this investigation. Jordan's megakaryocyte is not the same cell originally classified by Howell but is a precursor. Howell's⁽¹²⁾ megakaryocyte is the cell referred to in this work, since it has not been possible to verify Jordan's classification either on a genetic or functional basis. My observations on this cell once again agree closely with those of Maximow⁽²⁾ who refrains from committal on the question of function.

The stem blood cell moves along the line of megakaryocyte development without any initial structural changes to indicate the impending cytomorphosis. At first it simply grows in size, both the cell body and nucleus enlarging proportionally. The nucleus then becomes increasingly indented forming either two or three ovoid lobes. At the same time the chromatin material increases in amount and aggregates in irregular masses. Further lobulations develop, some of which appear to separate, but always alternate threads of nuclear membrane suspend them to the main nuclear mass.

Maximow and others regarded this lobulation as a "multipolar amitosis." From the material investigated there appears to be no reason to suggest any specific process other than that which occurs in the maturation of a polymorphonuclear leucocyte nucleus, except that the process is repeated a large number of times in various segments of the nuclear body, so that the resultant form of the nucleus is elaborately protean, consisting merely of a complex system of sessile lobulations which vary in size and arrangement. Such terms as annular, horse-shoe, crescentic, lobate, may be applicable to the same nucleus, depending on the place of section, the composite form being so variable that it defies description in simple analogy. Nucleolar-like bodies of chromatin appear in each lobulation, together with other angular masses of chromatin on the lining network. The cytoplasm is deeply basophile, increasing in amount with the development of the nucleus. The three zones described by Carnegie Dickson⁽¹³⁾ have not been seen. These cells arise early in myelogenesis, but not until erythropoiesis and granulopoiesis have made considerable progress. They may be readily found in long bones of rabbit embryos of twenty-eight days.

They usually first develop in groups of two or three and at this stage show no special preference for the walls of the capillary sinusoid. It is only in later embryonic life, when they develop in larger numbers, that they appear to be frequently related to the vessel walls. Large, pale, orthochromatic, degenerating forms are met with in all stages of development. Megakaryocytes have no genetic or functional connexion with the polykaryocytes or osteoclasts.

The Phagocytes of Bone Marrow.

The subject of the phagocytes of bone marrow from the pathological standpoint is a difficult and involved problem which cannot be entered upon, although it is felt that certain light can be shed from the study of these cells in normal growing marrow on the genesis and function of many such cells found in aberrant growth conditions of marrow, such as occur in pernicious anaemia.

All the phagocytes found were cells of the undifferentiated mesenchyme type, not arising, however, from the endothelium, although of the same morphological value, but developing from the reticular and stroma cells *in situ*; they arise merely by segregation and isolation, following the ingestion of particles of nuclear *débris* or red blood corpuscles. In the early stages of this work certain large cells were isolated in smear preparations, containing within the cytoplasm numerous haemoglobin staining bodies, from two to thirty odd, varying in size from a small, barely visible globule to that of an erythrocyte. These preparations were obtained from the marrow near the ossification line of newly born rabbits and guinea pigs.

Although with the technique employed (Jenner's), it was impossible to classify the cells, it was thought that they were special erythropoietic cells forming red blood corpuscles endogenously as plastids. This view was further strengthened by the fact that at this stage other cell *débris* was not found in the cytoplasm of these cells. Later, however, apparently similar cells were seen with chromatin particles interspersed with the haemoglobin globules. These were usually smaller and although they may have been cells of a different type, the original point of view was definitely threatened. With the adoption of new methods, these cells were all demonstrated to have the same morphological value and at the same time their genetic relationship with the undifferentiated mesenchyme cell was finally established.

In developing marrow these phagocytes are not very numerous. They are seen as discrete elements. Frequently they contain chromatin bodies resembling the nucleus of the late red series. This fact has been adduced as additional evidence in favour of the extrusion theory in the final maturation of the red blood cell. However, these cells are very occasional in erythropoietic foci. They have a random distribution and the ingested material may be derived from any of the tissue elements, from chromatin to eosinophile granules. Haemoglobin is not infrequently present in these cells at the same time as the chromatin masses, which resemble the

pycnotic nuclei. It would appear that they effect the removal of cell *débris*, especially senile types of myeloid cells which have hesitated in maturation and died.

The phagocytic cells found crowded with haemoglobin globules in newly born animals apparently represent an extreme physiological destruction of red blood corpuscles, most possibly associated with respiratory changes following birth.

Fat Cells of Bone Marrow.

During the early stages of myelogenesis the sparsely arranged mesenchyme cells of the reticular zone become widely separated, forming a loose stroma almost obscured by the abundant profusion of the rapidly growing myeloid tissue.

In this stage, although flattened and elongated, the reticular cells still preserve the pale vesicular nucleus of indifferent mesenchyme.

As soon as extrauterine life begins the process of myelogenesis becomes less rapid and the cell elements, as a result, appear less crowded. Fat storage begins with this diminished haemopoietic activity and progresses until eventually the myeloid cells are forced into the interstices of an adipose stroma which occupies the bulk of the marrow spaces.

The formation of fat cells from the reticular cells is associated with changes that precede the appearance of the fat globules. The flattening disappears, the cytoplasm increases in amount and the nucleus becomes larger and rounded. Eventually these cells become quite discrete and globules of fat appear first of all as minute granules which increase in bulk to form large granules. The nucleus then becomes eccentric in the cytoplasm and with the subsequent coalescence of the fat globules, finally flattens against the cell membrane.

During these processes of fat storage, no change occurs in the structure of the nucleus. As with the endothelial cells and phagocytes, it retains the characteristic nucleus of an indifferent undifferentiated mesenchyme cell.

Summary.

Myelogenesis is a growth manifestation of the multipotency of the indifferent mesenchyme cell.

The cell changes which initiate the process, begin after the formation of osteoblasts and osteoclasts, the stem blood cell maturing from the same type of primitive connective tissue energid that gives rise to the cells of bone tissue.

It develops near the ossification line in the syncytium of mesenchyme cells finally freeing itself from this tissue by mobilization of its cytoplasm.

Endothelial cells also arise from the mesenchyme syncytium in relation to channels which penetrate the syncytial plasm. They undergo no essential alteration in structure, retaining the vesicular nucleus of the indifferent mesenchyme cell. At no time are they isolated as free cells. Flattening is associated with fluid distension of the lumina which they bind. Following the development of capillaries and the formation and segregation of the stem blood

cells the remaining cells of the syncytium assume the form of a reticulum in the interstices of which the stem blood cells proceed with further development and proliferation to form the myeloid elements.

The reticular cells form an attenuated stroma supporting the developing marrow cells. Some of them become free to act as phagocytes, others form plain muscle fibres along the walls of capillaries, thus converting them into small arteries. The fat cells also arise from the cells of the reticulum.

Both phagocytic and fat cells retain the vesicular form of nucleus that characterises the mesenchyme cell.

In hæmatogenesis the stem blood cell manifests three divergent lines of development: (i) The red blood cell series by homoplastic development, (ii) the white blood cell series by both heteroplastic and homoplastic development, though the former is rapidly superseded by the latter, (iii) the megakaryocyte series only by heteroplastic development.

In the red blood cell and white blood cell series the early indication of these lines of development are characteristic and specific.

Changes in the structure of the nucleus of the stem blood cell, whereby the chromatin body fragments, indicate that the path of red cell evolution has been entered. The appearance of specific granules in the cytoplasm, without nuclear change in the stem blood cell, is indicative of the leucocyte line of development. The specific granules of the granulocytes are endogenously formed. In rabbits and guinea pigs they are of three types: small, round, acidophile, large, rod-shaped, acidophile and basophile. In the granulocytes the nucleus matures to form the polymorphonuclear structure characteristic of the leucocyte.

In the red blood cell series final maturation of the erythrocyte is associated with pycnotic degeneration of the nucleus and solution.

Extensive proliferation of the early types of both blood series occurs, creating a reserve for unlimited demands and forming the bulk of myeloid cells in developed marrow.

Technique.

Materials and Methods.

Rabbit and guinea pig were used exclusively. No essential differences in the processes described were found in these animals. Rabbits and guinea pigs form more convenient material than other animals, both because of the ease of breeding and because of the small bulk of the tissue. The former are pre-eminently more suitable, foetal growth being extremely rapid, a gestation period of thirty days resulting in a full-time foetal animal, approximately the same size and weight as a full-time foetal guinea pig which has a gestation period of seventy days.

All types of cartilage bones were used in various stages of development, especially the short and long bones of the fore and hind limbs. Metacarpal and metatarsal bones are exceptionally satisfactory, small, rapidly penetrated by fixatives; once the integument is removed, they require no further handling.

For purposes of description and illustration rabbits and guinea pigs were used.

The foetal animals were delivered through the abdominal wall, after the mother had been killed by fracture—dislocation of the neck. Tissue required was rapidly dissected and transferred to the fixative in as recent a state as possible.

Fixation.

Bulk tissue, consisting of bones freed from the surrounding skin and muscle was fixed in a saturated solution of mercuric chloride in saline solution at 37°C. to one hundred cubic centimetres of which 0.5 to 1.5 cubic centimetres of 1% osmic acid solution were added immediately after the tissue was introduced. To prevent vapourization of the osmic acid, the specimen bottles were tightly corked. Long bones of more than five millimetres in diameter were sectioned longitudinally. Ten to seventeen hours' immersion, depending on the size of the tissue, gives adequate fixation. If the quantity of osmic acid solution introduced is insufficient, the tissue becomes dark brown in colour. If left for a single period, the mercuric chloride tends to make the tissue very brittle.

Decalcification.

Foetal bones.—Rabbits up to the termination of the gestation period were transferred after fixation in Zenker's fluid, for forty-eight hours. This treatment serves a double purpose, both decalcifying young bones and acting as a satisfactory mordant, especially if azure stains are subsequently used. To preserve the fat cells, the tissue was immersed for eight to ten days in Zenker's fluid, with two cubic centimetres of a 1% osmic acid solution to every hundred cubic centimetres of fixative.

Perenyi's solution was found to be the most suitable reagent for the decalcification of more mature bone. If not used too long, the cell preservation is not affected, a small amount of shrinking obscures the finer detail, but does not interfere with the identification of the different cell elements.

Teased and smear preparations were treated with the above fixative for ten minutes and then transferred to Zenker's fluid for a further ten minutes. Osmic acid vapour was also used for smear preparations, in which case Mallory's triple connective tissue stain was found to give very satisfactory results.

Embedding.

Paraffin and celloidin were both employed. For paraffin embedding the tissue was passed through graduated spirits, beginning at 30% and rapidly ascending through 50%, 60% and 70% to 80%; and hardening in the latter was continued for eight to twelve hours; finally the tissue was passed into absolute through 90% alcohol, two changes of the former being used over a period of four hours.

Cedar wood oil was used in two changes over seventy-two hours, for removing the alcohol.

The tissue was then transferred direct to paraffin with a melting point either of 49° or 50°C. In-

different results may be anticipated if the paraffin be permitted to pass above 56°. Four baths of paraffin over twelve hours remove the cedar wood oil.

The thin sections obtained with the paraffin afford a considerable advantage over the celloidin method.

Staining.

Eosin and azure or Wright's⁽⁵⁾ polychrome methylene blue and eosin give good results. The least capricious staining was obtained with 5% aqueous eosin and Grubler's polychrome methylene blue, 0.25, differentiated in 3% colophonium in 95% alcohol (after Wright). This stain is especially good for cytological work when employed after fixation as described above.

Conclusion.

The simple interpretation of the facts recorded in this work renders many of the ardously disputed problems in hematogenesis superfluous. For this reason little use has been made of the literature and the current teachings in hematology, especially in regard to the complex pedigrees of myeloid cells. It would appear that there are certain morphological features which are valueless in undertaking a classification of blood elements with a view to establishing genetic connexions.

When a cartilage cell passes to the hypertrophic stage from the resting stage, extreme differences in size and shape occur and the staining reaction is modified throughout the process, changes which profoundly alter the gross histological character of the cell, although not affecting its essential structural features and which are indisputably bound up with functional activities in the life cycle of the cell itself. Such morphological variations are manifested by various marrow cells and if considered in assessing the types and orders of transition forms, lead to endless difficulties and unwarranted complications.

It is felt that the use of terms has tended to accentuate these fallacies and even for this reason alone it was deemed desirable to avoid the use of them. However applicable they may appear to be in fixed preparations, once applied to intermediate forms in a series, they have the effect of destroying cytogenetic values.

In the red blood cell series such terms as erythroblast and megaloblast are currently used with the idea of defining stages, whilst in reality numerous transitional forms exist under these terms merging indefinitely one into the other, changing and proliferating ceaselessly towards the fulfilment of a final maturation, a process which cannot be interrupted even for the application of a mere term.

From the above points of view many of the controversies in hematogenesis lose their importance, especially those relating to the stem blood cell and its multipotency. Maximow has thrashed out the issues involved in this dispute in an able manner and it is sufficient to record that the facts elicited in this investigation support his argument as far as myelogenesis is concerned.

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PRACTICE OF PREVENTIVE MEDICINE.¹

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IN so far as the healing art is preventive in its aim, it may be said that the practice of preventive medicine is as old as medicine.

No doubt, moreover, physicians have always given advice of frankly prophylactic intent within the limits of the knowledge of the day and probably far beyond those limits! But I am no scholar and will dispense with any attempt at a conventional historical review and beg to be allowed to confine my remarks to personal experience and impressions.

That experience is probably not exceptional in that twenty odd years ago I survived a course of medical training in which no emphasis at all was laid upon preventive medicine. The prevention of disease was in fact hardly mentioned.

The curriculum did include lectures and an examination on public health. The subject was then on the whole as dry as dust, lightly regarded, mostly empirical, largely plumbing, engineering and statistics. Even the bacteriological and the brief course on infectious diseases were focussed mainly on diagnosis and treatment.

That ended, I became a resident pathologist at a general hospital and took the course for the diploma of public health. Of this a long but, I think, largely unnecessary course of analytical chemistry formed a major part, though much of the rest of the work,

¹ Read at a meeting of the Victorian Branch of the British Medical Association on October 5, 1927.

bacteriological, administrative and practical, was necessary and useful to one who was specializing in public health.

In that course, too, however, I heard little or nothing of preventive medicine as it is now understood in its more personal aspects.

There followed two fortunate years of work in hygienic institutes in Germany and Switzerland, dealing mainly with water and sewerage problems and with bacteriological and serological investigations in connexion with infectious diseases.

I appeared then to be well qualified after nearly ten years' studentship to take a post as one of the Assistant Medical Officers of Health in Birmingham.

Looking back upon my time there, I feel I must confess that the salary of £250 was as much as the job was worth—largely a routine of supervision of inspectors and of tinkering with a well-nigh hopeless housing problem, the magnitude of which only those who have seen such can appreciate.

The bright spots were investigations and some research on infectious diseases and the beginnings of infant welfare. A comparison of infant welfare work in those days and in these makes me appreciate the great changes which have taken place. I was deputed to preside at sessions and to direct the work of nurses, without knowing the first things about it—first things such as are now broadcast in the popular works of Truby King, Margaret Harper and others.

Incidentally I may mention that Birmingham then had an infant mortality of well over the hundred and in large areas well over two hundred per thousand births; whereas it now has an infant mortality in the sixties, lower than that of Melbourne and I see by the last report that the corporation employs five full-time and twenty-five part-time medical officers and over seventy nurses on the work.

Then came the war with its large scale applications of prevention, notably of bacterial diseases—typhoid and paratyphoid fevers, tetanus, malaria, typhus, trench fever *et cetera*—but also of non-bacterial conditions such as trench feet. With it came also the discovery of the alarming physical condition of the average adult male, as exemplified by the well known results of the examination of the 2,800,000 conscripts and a large scale demonstration of the efficacy of proper food, fresh air and exercise in building up the health of many weedy individuals. There occurred also involuntary "experiments" on a large scale on the effect of imperfect dietaries under conditions suitable for the recording of results. Not to be overlooked, either, was the evidence that the extreme exposure, chilling, wet-clothes-and-boots life of the trenches did not lead to any increase of respiratory complaints which, however, spread freely in the more confined comfort of rest billets and camps.

At the war, too, I found that it was both necessary and practicable to give lectures and talks to combatant officers and non-commissioned officers regarding hygiene and the prevention of infectious diseases, explaining in simple terms the life history of the various organisms concerned and the rationale

of the measures recommended. I became convinced in fact of the value of propaganda and publicity in preventive medicine.

After the war I came to Western Australia, where as Medical Officer of Health I entered upon what was to me a wonderful period of enlightenment, due in the main, I think, to the vitalizing of the science of hygiene by the work of the physiologists. The reading of such works as those upon nutrition by McCollum and Simmonds, McCarrison, Mellanby and the Medical Research Committee, upon biophysics by Leonard Hill, upon general physiology by Bayliss, upon the practice of preventive medicine by Newman, together with a host of articles that have appeared in the various journals upon the above subjects and on others, such as infant feeding, posture, the significance of focal sepsis, intestinal intoxication *et cetera*—all these opened up a new vista of the possible extent of my job. This reading, coupled with the fact that my duties included the charge of school medical work, lecturing at the Teachers' Training College, to nurses and many other audiences and assisting to develop an infant welfare service in the State greatly increased the interest of the work.

We of the public health service had already realized the importance of the personal side of public health, that is, of the habits and behaviour of the individual, particularly in connexion with infectious diseases; but in recent years we have come to look upon the individual from quite a new point of view, that of his health rather than of his disease, from that of physiology rather than that of pathology. We have come to appreciate that the essentials of animal health, the natural laws governing it, are becoming understood; that lack of essentials leads to deficiency, to poorliness, incapacity and vulnerability which form the basis of a great proportion of the eventual manifest disease which a patient takes to his doctor.

You will appreciate how this discovery, so to speak, of health and of the deficiency state has enlarged the scope of preventive medicine and how it has forced those of us engaged in that work in two directions, namely education in hygiene and child welfare.

I might write a sort of Health Officer's "Creed" which would run something after this fashion:

I believe in the unity of animal life, the general applicability to man of the results of observations and experiments with animals, the overwhelming importance of environment as compared to heredity, the laws of health and the fundamental significance of deficiency disease, the great influence of small causes acting over long periods and the preventibility of all disease.

If we are to accept, for example, the statements of research workers that ill-fed animals, such as puppies, pigeons or monkeys, could not be kept well and developed all sorts of infections, endocrine and general functional disturbances, whereas the control animals avoided these disasters; if we accept that the influence of diet upon the development and preservation of teeth and upon the functions of the bowel is understood and is controllable; if we accept, in short, that much of the

existing mass of disease is already preventible—and the evidence is becoming overwhelming—then what are we going to do about it?

You can imagine our position, faced with a high prenatal mortality, with an infantile mortality which, though falling, is still large both absolutely and relatively; with a school population almost 100% defective in some degree, as for example in the state of their teeth and including many already seriously damaged members and with an adult population that may be categorized as thoroughly toxic and septic, with relatively few individuals in full possession of all their potential faculties.

Obviously the task is not one which solely concerns public health officials. We are in fact lost. The task demands the cooperation of the whole medical and allied professions.

During the last few years an entirely new situation has arisen and it is one which deserves the fullest consideration by the organized medical profession and by the staffs of the medical schools. I think that a special committee of this Branch of the British Medical Association should be giving it continuous consideration.

Actually the various health authorities, acting on the advice of their medical officers, have ceased to attend merely to communal health matters, such as water supply, sewerage and housing and have concerned themselves increasingly with individuals. They have organized services which provide for the examination and advising of expectant mothers, infants and school children and for contacts of persons suffering from infectious diseases, notably tuberculosis. In the realm of actual treatment they no longer confine themselves to the treatment of certain infectious diseases, they have largely taken over the treatment of venereal diseases and of tuberculosis and are undertaking increasingly the dental and ophthalmic treatment of children. The number of professional officers thus engaged as public servants is increasing by leaps and bounds; whilst in Great Britain, as you are aware, many health authorities provide treatment centres for children for many special diseases and in some instances even provide hospitals for general diseases without regard to age, in what seems to amount to open opposition to the general practitioner. Thus there exists undoubtedly a tendency for health authorities to invade the field of ordinary medical practice and to compete with the private practitioner. There is in fact both here and in most countries a State medical service of limited scope; whilst in Germany and England and probably in other countries, as you well know, the great majority of the profession is included in a part time state or communal service of very wide scope.

I will not try to discuss the pros and cons of a State medical service which need not concern us tonight. I wish merely to insist that to set up any measure of State medical service in competition with the private practitioner would be disastrously wasteful. The powers of ignorance and disease are so strong that the attacking forces must act in concert to achieve success.

But the gist of my argument is that personal preventive medicine or individual health service is now so soundly based and well accredited that its practice is inevitable and that unless that practice is combined with treatment and carried out by the same personnel, we shall run the risk of a double service with overlapping and with deplorable friction and waste of effort.

May I ask you to reflect that health authorities have been impelled to undertake maternity and child welfare work, dental treatment *et cetera* because it so obviously "does not pay" to neglect the conditions dealt with. That argument is capable of infinite extension. It does not pay to neglect to prevent disease at any age or under any conditions. Prevention actually is better and cheaper than cure and to prevent the double service that threatens us, the private practitioner must practice preventive medicine.

It has often been asked what part the private practitioner should play in public health work. Formerly that question was not easy to answer. We have been advised in the past that he should notify more cases of infectious diseases than he does, that he should examine contacts more thoroughly, take swabs and so on and be paid *pro rata* by the health authority. But if we include in public health work the prevention of disease in individuals, then there is no difficulty as to what he may do and if we educate the public to demand the service, then there will be no difficulty about the payment either.

I appreciate fully, I hope, how easy it may have been for busy practitioners to have failed to observe and weigh or evaluate the developments in the science of preventive medicine to which I have referred. I know that the specialist has his work cut out to keep in touch with developments in his own branch. How much more difficult for the general jack-of-all-specialities practitioner to follow the developments on all lines and I fear he has been tempted to neglect the preventive side, leaving it more or less deliberately to public health officials and incidentally to all manner of quacks and faddists. In my opinion he cannot afford to do so either in his own or in the public interest. He is the man for that job.

In conclusion may I suggest some of the directions in which the study and practice of preventive medicine by general practitioners are urgently indicated.

1. Nutrition and dietetics. This is a field in which fads, exaggeration and quackery are admittedly rampant. I have followed the literature as well as I could and am convinced that diet is the most important of the environmental factors governing health and disease, in that it is the one most readily interfered with, most frequently at fault and often most easily corrected. It is also a most complex and difficult subject which surely offers many opportunities for observation and research on the part of the private practitioner. It is impossible to go into any detail, but I agree with Dr. Moore, of Dunedin, who suggests that a dietetic conscience is as necessary in medicine as is an aseptic conscience in surgery.

2. Antenatal and infant welfare work. This is a subject which has been lamentably neglected in the past and is still to some extent deliberately and most regrettably avoided.

3. The specific prophylaxis of infections including infectious diseases. This is a field of work which depended in its earlier stages upon such expensive and prolonged bacteriological and serological investigations that the busy general practitioner could hardly cooperate. Now, however, that procedure has been more or less standardized and material is or can be made available, the field is ready for the general practitioner who should do much of the work. The typhoid group, diphtheria, scarlet fever, measles and tetanus are among the diseases which he should be able to deal with, possibly also whooping cough and puerperal sepsis. And does the general practitioner no longer "believe in" vaccination?

4. The periodical overhauling of the so-called well. The results of the examination of expectant mothers, of school children, of recruits or candidates for military and civil services and employments and of insured persons amply indicate the possible extent of this activity.

As already mentioned, the extension of the practice of preventive medicine by the private practitioner waits upon the education of the public as to its desirability and value. Ignorance and tradition and quackery block the path. In my opinion education may be hastened by the following measures:

1. The development of the teaching of nature study, physiology and hygiene in schools and colleges, aiming at a popular appreciation of health and of the nature of disease. It should not have been left to a small society recently to send a deputation to the Minister of Education on this matter.

2. Organized educational propaganda by the medical profession in the press and in journals. However distasteful to the profession advertisement may be, there can be no denying its propriety or value under existing conditions.

3. A change in the attitude or etiquette or aloofness of the profession in the direction of greater frankness with the public. The profession has no secrets to hide. It has much to give and is not afraid to confess that it has much to learn. The patient who discovers that *aqua* means water, is apt to get a false and misleading impression. Perhaps, however, the change here suggested is already taking place.

In addition, I think that those responsible for the medical curriculum and for post-graduate courses should aim to stress increasingly the preventive side of medicine.

Finally, may I say and I believe that I can speak for my fellow officers on the point, that we of the public health services earnestly seek to avoid any suggestion of antagonism between ourselves and the rest of the profession. Apart from our regard for our own skins we know, as an American writer recently put it, that "the physicians of a country can make or break any public health programme." Not that we have any pretentious programmes to

proclaim, but we know that there is much to be done and we feel that the result of our efforts will depend very largely on whether we succeed or not in retaining the goodwill and cooperation of the rest of our profession.

ON DISUSED OR INSUFFICIENTLY USED METHODS IN PRACTICE.¹

By R. SCOT SKIRVING,
Sydney.

IN these days when the ancillary aids to the practice of our profession play so large and proper part in diagnosis and treatment, the minds of older men not unnaturally turn to the conditions which obtained before X rays, bio-chemistry and bacteriology, to name only three comparatively recent advances in science, were known and when diagnosis was more completely dependent on clinical care and experience and treatment was very empirical and at the best mostly founded on personal observation. Undoubtedly these were often days of darkness and much was done or left undone for lack of modern knowledge.

Yet we have, I think, lost somewhat by these shorter and surer cuts to correctness and so I have taken as the subject of my little talk tonight a few of the things wherein the old practitioners seem to me to have been right practically, though they built indeed perhaps better than they knew.

Take blood letting, active or into the patient's own vessels. No one could possibly read about the grotesque and dangerous excesses of practitioners of the long past, one hundred years ago and further backwards, without pity and aversion. Not seldom the patients were slain outright, being simply bled to death, but I am persuaded that even now wise blood letting in suitable cases may do much good. I have myself let blood quite a number of times in my life, occasionally with benefit and at least without doing harm. In sthenic pneumonia I admit a violent onset in a plethoric patient may quickly enough become a case for stimulant treatment rather than depressant remedies. Antimony must indeed be but seldom used now by the younger practitioner; rather will he use the remedies given him by the bacteriologist and bio-chemist. Nevertheless I have seen a dusky face and profound cardiac distress relieved by a timely venesection. I read with approval in a very recent discussion on the treatment of pneumonia that venesection in that evil condition where "heliotrope cyanosis" is present, is highly recommended. I remember a case of attempted suicide by hanging in which the desperate condition of the would-be suicide made it almost certain that he had succeeded in his effort at self-destruction; yet opening his external jugular vein was in a few minutes followed by a dramatic improvement in his condition. In certain toxæmic states, too, one is forced to believe that blood letting does good. Do we use it enough now? I am inclined

¹ Read at a meeting of the Eastern Suburbs Medical Association on October 21, 1927.

to think not. I am satisfied I have seen a timely venesection relieve the risk of an apoplexy in a patient with a systolic blood pressure over 240.

Wet cupping also had a great vogue in the past. I actually own the kind of instrument used. I do not advocate its use for it is really incapable of efficient sterilization and I have seen infections resulting from its use.

But dry cupping is another affair. Why don't we use it oftener? In lumbago it often acts like a charm. I honestly believe it somehow does good in acute nephritis with suppression of urine; also in capillary bronchitis and perhaps even in the early days of pneumonia.

Have any of you ever tried to abort a boil by the application of a small cup over the infected area? It is in this case only a very localized kind of Bier's treatment, inducing a more active phagocytosis. Indeed I doubt if Bier's treatment with a properly applied elastic bandage above the affected region is used as often as it should be.

Leeches were in constant use in my house-surgeon days. A big jar of these uncanny creatures lived in every ward. Especially were they used in inflammatory conditions of the eye. I have even seen them put on the *cervix uteri*, but I never could bring myself to apply them in that place. I always liked actually to see them at work and not to let them loose in a region so hidden and adventurous. I am sure they have still a field of usefulness and I cannot remember seeing septic trouble follow their use, as I have after wet cupping. Remember, however, never to apply them to an acute gouty joint or you will regret it and please remember, too, never to use arnica in gouty conditions or you will quite likely set up a violent local reaction.

I doubt if we use heat and cold now as much as we used to. Poultrices are out of date. I admit they are usually smelly and dirty, often badly made and worse applied. Yet they gave a kind of comfort to the patient, perhaps they acted as a "derivative," whatever that may mean and they were certainly a kind of domestic application of Bier's treatment which the youngest of us will admit is founded on scientific grounds. "Antiphlogistine," "the bloodless phlebotomist," is the modern equivalent of the old disgusting bread poultice. I am, however, glad that we make good use of radiant heat.

Take migraine. There are two types, the "*sympathetico-tonica*" and the "*sympathetico-atonica*," as Ross described them over thirty years ago. In the former the face is pale, in the latter it is congested. One needs a vaso-dilator such as a hot application, the other gets relief from an ice bag.

Polypharmacy is a remnant of past centuries. So is a blind faith in absurd medicaments. Still our fathers mixed certain drugs into very cunning efficacious prescriptions and ordered certain beneficial substances empirically, the use of which is being forgotten. Take yeast. I do not discuss how it acts, but I am satisfied that in staphylococcal cutaneous infections, such as boils and carbuncles, that it is quite a useful measure.

Do we all remember that in patients sensitive to iodide of potash doubling the dose is often as good as adding arsenic to the prescription in relieving the coryza or an iodide rash.

I wish the rising generation more freely used *liquor ammoniac acetatis* and *spiritus ætheris nitrosi* in the beginnings of acute feverish conditions, such as colds, influenza, even in pneumonia and especially in the so-called febriculas of early life. These drugs were trusted weapons in the hands of the old time doctor.

Niemeyer's pill certainly did what it was asked to do in night sweating. I do not discuss whether night sweats in phthisis ought to be treated *per se*, but they are certainly disagreeable and exhausting incidents. Let us say that they are due to toxins absorbed into the circulation. Well, such resorption in many septic conditions bears an inverse ratio to intestinal absorptions. So at night with an empty digestive tract, resorption goes on more quickly than in the day with a food fed alimentary tract. Let the patient have some light nourishment at bedtime, a tepid sponging over his body and take old Niemeyer's pill of digitalis, quinine and opium and not seldom will he have a better night and a drier night shirt.

So also is Guy's pill most useful in cardiac dropsy and to a less extent in anasarca of renal origin.

In prescribing diuretics, Grainger Stewart, no mean authority on the use, used to say that here at least was an instance where a moderate polypharmacy was correct in its results. So I think that several diuretics may be combined, say acetate of potash with digitalis at any rate. Often a diuretic will fail to act till you give it a start by mechanically slackening the flattened out lymphatics by first removing a lot of fluid by tapping or Southey's tubes.

Aloin pills are admirable in chronic torpidity of the large intestine, but I also believe that if piles be present aloin often makes them worse. When you are using saline cathartics, use fairly concentrated solutions. You will thereby get a greater liquid catharsis with less rumblings and colicky pain than when they are taken freely diluted. In getting rid of serous effusions this old world practice is worth remembering. Rhubarb was too much used long ago. It has a disadvantage in that it leaves a subsequent constipation. I think its purgative effect is due to cathartic acid, but it also contains tannin which subsequently binds.

Here in Australia we are or were at any rate always on the look-out to explain not only a gross swelling, but aberrant signs in many pathological conditions by the diagnosis of hydatid disease. You often hear of "hydatid thrill." It is not a common sign. I consider that when present it is usually due to a big cyst packed with daughter cysts at a certain tension. If you follow the method I use you are most likely to elicit the sign. Put your left forefinger firmly on the swelling and percuss it hard with the right fore and middle fingers. The sensation of "thrill" occurs at once and is due, as I think, to the cannoning of the little cysts against each other. In my experience this is a far surer

ILLUSTRATIONS TO THE ARTICLE BY PROFESSOR C. WITHERINGTON STUMP.

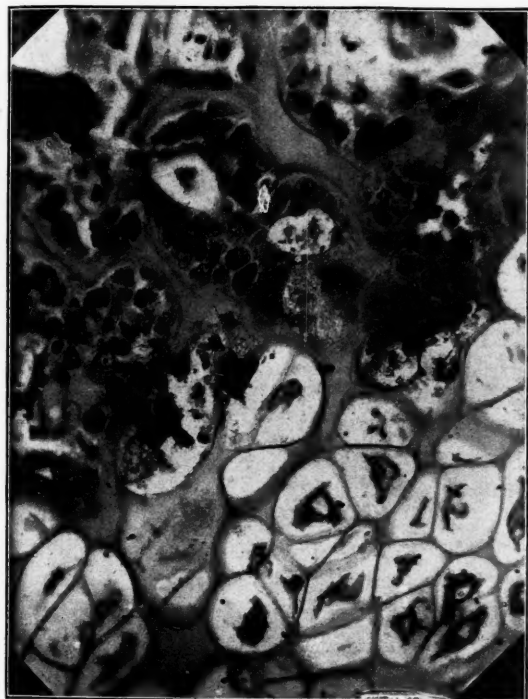


FIGURE I.
Undifferentiated connective tissue in the form of a mesenchyme syncytium penetrating the cartilage capsules at the ossification line. The mitotic figures are an indication of the active proliferation of the tissue in this region. Capillary lumina are evident.



FIGURE II.
Capillary formation by vacuolation of syncytial mesenchyme. Below the capillary lumen stem blood cells are seen in process of mobilization from the indifferent cells. One stem blood cell is completely isolated.



FIGURE III.
Stem blood cells showing the character of the chromatin aggregations within the nucleus.

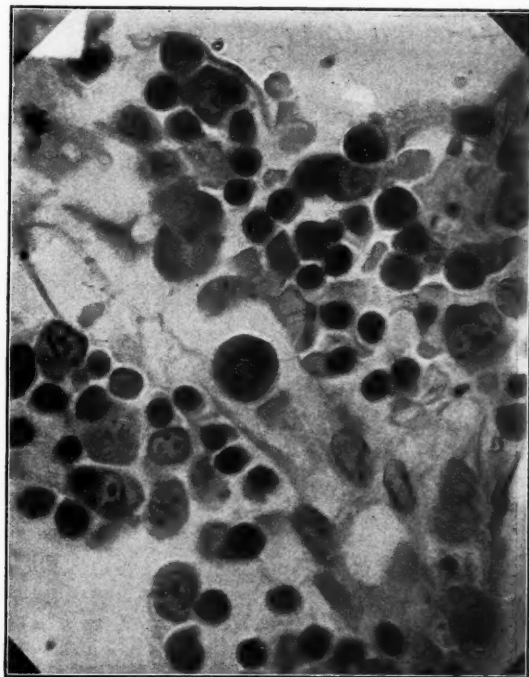


FIGURE IV.
A focus of red blood cell formation showing all stages from the stem blood cell to the fully formed erythrocyte. The relation of the endothelial wall of a capillary to the focus is clearly shown.

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FIGURE V.
A red blood cell focus showing undifferentiated tissue forming a reticulum.

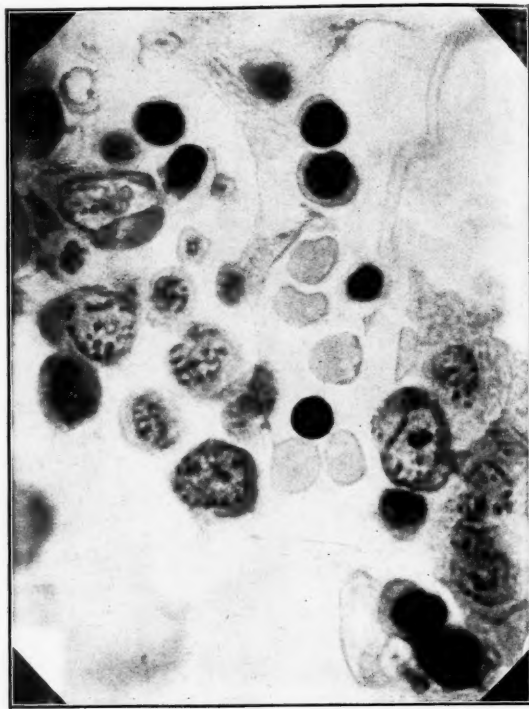


FIGURE VI.
A red blood cell focus with all stages of maturation represented. A stem blood cell entering the path of granulocyte development is depicted (A). Three or four granules (eosinophile) have made their appearance in the cytoplasm around the periphery of the attraction sphere.



FIGURE VII.
Early development of the megakaryocyte. The first lobulation of the nucleus of the stem blood cell.
The photomicrographs were made from section preparations.



FIGURE VIII.
A young megakaryocyte showing multiple lobulations of the nucleus and relatively large proportions of cytoplasm.
Panchromatic plates were used in combination with Wratten

method of demonstrating "thrill" than tapping at a distance with one hand as we do in searching for fluctuation in the abdominal cavity or elsewhere.

A point in hydatid disease of the right lung is that a big cyst there often notably depresses the liver, whereas a single pleural effusion does not, unless the effusion is very large in amount.

In urethral strictures and difficult catheterization in prostatic obstruction I often think that putting an instrument into the bladder would be easier and less likely to do damage, if we always injected a little sterilized oil down the urethra before inserting the catheter or bougie. So also does the previous use of a little eucaine with adrenalin help the passage of the instrument. In the case of prostatic difficulty I seldom see one of James Spence's old tricks made use of, namely, give a gum elastic cathetic a good full prostatic curve with the stylette in it and pass it down to the point of obstruction, withdraw the stylette half to a whole inch, press gently in the correct axis with the usual depression of the distal end of the catheter and it will often slip in when you have failed without this little manœuvre.

Why do we not use Corrigan's button cautery and blisters more often? In sciatica they sometimes act like a charm, temporarily no doubt, but it is worth a trial in such cases and certain others of neural pain and in indolent arthropathies.

Not every case of hernia in an infant calls for operation. As Mr. Spence used to say and as I believe, the obliquity of the canal increases with growth and quite a number of these herniæ disappear. Trusses in infants and young children, if they have to be used, are often horrid things. If you badly want a truss in a hurry why not make one of the old "selvagee strops"? Measure round the waist from the inguinal canal and back and then down between the thigh and genitals and so backwards to where the strop will encircle the waist. Make a strop and dip one end through the bight placed over the hernia, bring it back through between the thigh and the genitals and tie it with a tape at the back. It is quite curious how this trifling makeshift of "fingering wool" does its work as well as a shop made truss.

Perhaps it is really true that certain diseases are actually commoner now than fifty years ago, although something must be allowed for improved diagnosis. I began medicine in preappendiceal days. That disease did occur, but was called perityphlitis, but I am sure it was not the daily stock pot of the practitioner as it is now. There are also other maladies which seem on the increase, while others are less common or are milder in type.

How often do any of you see frank gout? Not very often, I think. How often do you meet with typical chlorosis with its unmistakable appearance, so that a glance sufficed for the diagnosis? Why has it disappeared? I think a more outdoor life for girls with less constipation, plenty of exercise and also perhaps, who knows, the disuse of corsets and tight lacing may explain its rarity. The modern

girl is not, I confess, a violently attractive personality in some of her aspects, nor does she promise well as the potential mother of the coming generation, but at any rate she is not much given to "faints" and she does not suffer from "green sickness" in the way her Victorian grandparents did. Sir Andrew Clark used to say that if he had to choose between iron and purgatives for the cure of this malady he would take the latter. Hence perhaps the excellent aloes and iron pill which bears his name. But along with the regular evacuation of the lower bowel, the use of carbonate of iron in large doses worked miracles in making a puffy anæmic girl active and rosy. Indeed the miraculously quick results of Bland's pills to pale girls was on a par with the miracle of "606" in urgent syphilis or quinine in malaria.

No doubt the foolish faith of our forebears in complicated and absurd prescriptions was pitiful and disastrous, but even now our camp followers, the manufacturing chemists, as Osler called them, pelt us with the literature of synthetic preparations, mostly boosted in the "Champagne-English" of business America! The bulk of these preparations, I take it, has a short day and ceases to be and rightly. Their name is legion and I doubt if one in twenty deserves a permanent place in therapeutics.

I do not think we are in these days so observant of the facies of disease as our medical forebears. I wish we were. I see men scamp through what I think an insufficient clinical examination and then rush the patient off to one or other specialist in X rays or bio-chemistry. Quite right, but let them at least closely observe the patient, get a decently complete history, personal and family; note his appearance and his physical signs and then and not till then invoke the ancillary sciences. I never seem now to observe the same interest in the look of the patient which the old practitioners dwelt upon, say in tuberculosis, the configuration the thin transparent ears which seemed to stick out, the flush on the face

Which painted with rude humour
The ruddy tint of health

instead of being just "death's disastrous rose on either cheek" for all to see, who could both see and understand. I think Tennyson's "May Queen" was such a case. The gouty face, too, was a facies our ancestors could tell at a glance. Grainger Stewart used to tell us how the faithful painters of the Renaissance Popes were so true to life in their work that he could tell those Pontiffs who had suffered from *morbis Brightii*—they had especially the "bright eye" of that disease.

Another of Grainger Stewart's injunctions was "Try and realize in your own mind if the patient is truly ill by noting his colour, his expression, the way he breathes and so forth." Who with any powers of observation can forget the facies of people immedicably ill of a mortal disease? Yet I have seen men with plenty of learning, little wisdom and no horse sense, look at a patient with a desperate abdominal condition and fail to realize that

a few distressful days or even hours must see the end of his life. To them passed unheeded

The anguish of a last infirmity

The toss for ease, the gasp for air

The visage drawn, the Hippocratic stare.

Most of us are pretty smart in sizing up the patient who takes too much alcohol, even without the grosser signs of neural or visceral poisoning. Quite a literature has cropped up lately on the signs of being drunk. Here I wish rather to praise a point in the diagnosis of chronic alcoholism—I refer to the “sign of Quinquaud.” The patient spreads out his fingers and presses them at right angles to the palm of the doctor which is held in a vertical position. For the first few seconds nothing particular is noticed, but if the patient be a chronic misuser of alcohol one soon begins to feel a series of curious slight shocks. A kind of “spirit rapping” if I may say so, as if each finger were knocking one against the other and against the palm of the doctor. It is difficult just clearly to describe the feeling, but, once felt, it is ever after clearly remembered in later cases. I do not infer that this sign is pathognomonic, but it is certainly highly corroborative.

I think we often now in our scientific cocksureness do not always remember that there is really such a thing as idiosyncrasy to the effect of drugs.

I am ready to believe that a patient with increased intraocular tension, sensitive to belladonna, might have an attack of glaucoma precipitated by its unwise use.

I spoke of iodide of potash. Some people are made intensely unwell by quite small doses; I remember an infant apparently killed by 0.12 gramme (two grains). I mentioned arnica being unsuitable in gouty persons. Quinine also may sometimes produce alarming and even a fatal result in some patients. I am not here alluding to any connexion it may have in precipitating an outburst of blackwater fever. I recollect taking Sir Phillip Sydney Jones to see a patient with me. True, the man was hopelessly ill and would have died in any case. We ordered him 0.3 gramme (five grains) of quinine every four hours for four doses. The patient said: “Well, twenty years ago I was given quinine and it made me so ill that I nearly died.” We persisted. He took 0.6 gramme (ten grains) and collapsed. I fear it was a *propter* and not a *post hoc* in this instance.

I alluded to belladonna's mydriatic effect. It and hyoscine are both drugs in connexion with which one ought specially to consider idiosyncrasy. So also is opium. I have over and over again seen these drugs in quite small doses produce exaggerated and rather disquieting effects. Chloroform as a general anæsthetic, used in conjunction with a perfectly legitimate strength of adrenalin used locally, may bring about a condition of danger.

“Urotropine” is now given sometimes in massive doses, yet I have seen quite moderate amounts produce acute vesical irritation, even to the passage of blood.

Oddly enough I can remember more than one case in which that innocent salt, bicarbonate of soda, has made patients very unwell with much gastric and vesical disturbance.

Pilocarpine is another tricky drug; 0.01 gramme (one sixth of a grain) is a moderate dose rising to 0.02 gramme (one third of a grain), but if you combine its use with a vapour bath, then the dose ought only to be 0.01 gramme. Pilocarpine in doses over 0.01 gramme is apt to depress too much, to cause vomiting and unpleasant salivation. When one cannot have a proper vapour bath outfit a good substitute is that used by Sir James Simpson, plenty of bottles filled with hot water and wrapped in flannel or woollen stockings wrung out of boiling water.

I think eserine and “Pituitrin” are very valuable in abdominal distension not due to a mechanical obstruction, but I wish we had a good purgative to administer hypodermically.

With regard to operations, I have always thought it quite right that before a patient is submitted to operation his stomach and bowel should be empty, but in regard to the latter purgation is often overdone. A too brisk purge and an enema are hardly pick-me-ups to precede a big operation. I have therefore always tried not to overdo this preliminary bowel clearing.

Many operating tables are cold, hard, uncomfortable things. I have seen only one really perfect table the surface of which was moulded to the curves of the dorsal aspect of the body, and, further, it had a proper series of hot water chambers which were filled by water at a reasonable temperature and permitted necessary changes of axis. Years ago I believe I was one of the first in Sydney to advocate and perform operations between seven and ten in the morning. Such a time has many advantages. The surgeon and nurses are fresh; so, I hope, are the patients. At any rate they have just finished a night's rest. Their stomachs are not loaded or kept too long empty by delay. There is no anxious waiting till a later hour is struck and, further, if anything goes wrong, say reactionary bleeding, it is still daylight in which to deal with it.

I stress the matter of keeping the patient warm on the table. I know. I can remember one fine healthy attack of lumbago from chilling on the table during the performance of a not very prolonged operation on an infernally hard cold table.

Focal sepsis was not thought of forty years ago. Patients went to their graves with their mouths a veritable necropolis of dead teeth. Though focal sepsis is a very real thing, we have gone to the other extreme of too great meddlesomeness. Septic teeth, an infected antrum or a cheesy tonsil, do provide sources of septic absorption and need attention, but do not let us ride the hobby till it is perfectly unsafe to consult some enthusiasts in the cause. I fear many edentulous persons are going about today sadly regretting the absence of teeth which in many instances were doing no harm. For them also the last state of the patient is worse than

the first for their sciatica or whatever ill they had to start with remains uncured.

Up to fairly recent times the cult of the pulse was one of the treasured pieces of clinical knowledge of the doctor. The "erudite finger" was a great gift or acquirement. Now we neglect it not a little for have we not the sphygmomanometer, "an instrument of precision"? So it is if rightly used and evaluated. But it is no mysterious "Abrams box" to settle our difficulties. The man and the instrument have first to be right in judgement and repair. Isolated observations are inconclusive or misleading. A pressure may be too high or too low from evanescent conditions. Emotion, discomfort, hurry, worry, various toxæmias, may all alter it widely from the admitted normal. Several observations may be necessary.

A point to which I have been paying some attention lately is what is the normal systolic blood pressure in Australia in people for the most part middle aged or elderly?

I hope later to publish some notes on this matter, but I take this opportunity tonight for the first time of drawing attention to the fact that my observations lead me to believe that the systolic blood pressures here in New South Wales or indeed in Australia are frequently a good deal higher than the systolic pressures tabulated as normal in British or North American statistics. This applies to observations on persons mostly over forty in whom no causal condition can be found and who seem to be in perfectly normal health in every way. Even between thirty and forty I often find blood pressure higher here than is normal elsewhere, but I repeat it is especially after forty that this divergence is so often seen. I would like to hear if others have noted this point.

Abnormal blood pressure is a sign or a symptom, if you like, but it is not a disease, as patients would like to make us regard it. The cause is often difficult to discover. I suppose *per se* it does sometimes need treatment. For instance, as I said before, a venesection as a temporary expedient may avert the risk of an apoplexy and so an antipiesic drug may also be used, though I am against the idea that every raised blood pressure necessarily needs to be pulled down. I think that some antipiesic drugs do influence the pressure. Surely nitrite of soda does so. I imagine that when Bacon said "It is good for old men to eat nitre," that the reason of the apparent benefit was that the nitrate of soda was impure and contained the nitrite of that salt.

Whether "Guipsine" and "Anabolin," two new antipiesic remedies, are really of any lasting value I do not yet know, but there is some evidence that they are so.

And now to make an end of these discursive nothings. Your Secretary reminded me that today is "Trafalgar Day." One hundred and twenty-two years ago that great naval battle was fought. Surely we men of medicine have travelled far and well in our knowledge and practice since that day. It was a time in which excessive bleedings, horrible sepsis, no anæsthetics and a great lack of knowledge of pathology and rational therapeutics prevailed.

One can visualize the sanitary and surgical conditions in which Nelson died. They were indeed terrible. When one remembers such things, one forgets a little "the present discontents" and takes heart and however much in many ways some of us regret the so-called "good old days" when Bolsheviks were unknown, yet, in medicine at any rate, one is glad to have lived at a time when medical and surgical knowledge is on a scientific basis and when treatment is usually safe, clean and correct. But as the title of my address to you signifies, there were many good things to be found in the practice of our ancestors of Trafalgar times and later, which it is not wholly well to lay aside. I have mentioned a few of them, dealing with practical points, but there are some other things which our forebears possessed which we ought also not to forget—things rather ethical and educational than technical.

The modern medical man is no small technician. I do not think the public can complain that we are not well enough equipped in the purely professional side of our outfit. But are we as well stored in other qualities—acquirements and ideals of that fine type of doctor who was frequent in times comparatively recent? I think not. A good classical education is far less common now. I even doubt if the knowledge of one modern language is more usual today than in the past. In fact general literary culture is far less a possession of a professionally well educated doctor than it was. Nor are our ideals higher. Surely we are far more commercial in our attitude to our patients. We make our work more of a trade and less of a profession. Within limits I regard this as right, for we have to live by our work and medical men as a rule are poor business men. A good many of them fail to save anything. But it is surely possible, always remembering confiscatory legislation, to provide for old age by fair charges and some prudence in investment without looking at each case as a direct stockpot out of which to get as much as possible.

Dichotomy, one of the basest and most insidious of professional dishonesties, was unknown till recent times and the doctor of the past was really more of a trusted lay-confessor than he is now. The worst features of American professional usage seem to be at times creeping in upon us. The American College of Surgeons has a twofold function, both righteous and required, to raise the standard of hospitals and those who practise surgery in them; also to raise the ethical standard of the profession in the United States. I believe it will do much good. But I hope it will confine its excellent activities to its own country and leave Canada alone, for that great Dominion is well able to look after its own professional righteousness and surgical efficiency. Here in Australia our recently formed College is on somewhat similar lines and at the moment I think its first useful influence will be felt most on the ethical side of its twofold purpose. May it flourish!

Nelson died in pain in the cockpit of the *Victory*. No modern methods, Lister's teaching, anæsthetics or a laminectomy would have saved him. Perhaps

it was well for his happiness that he passed away in a blaze of glory. Most of us know that one of his Captains, Benjamin Hallowell, a gigantic unconventional Canadian with grim humour sent Nelson a present of a coffin made from the mainmast of the *Orient*, the French flagship at the Nile, saying "that when he (Nelson) was tired of life he could be buried in one of his own trophies." In this wooden shell all that was mortal of Nelson's radiant personality was interred. But few know the curious story of the sarcophagus in which was placed this wooden coffin.

It was a noble piece of monumental work made for Cardinal Wolsey nearly three centuries earlier and intended by him to receive his own body. But the jealous rage and blood-thirsty despotism of his master Henry, great King nevertheless, as he certainly was, decreed the fall of his too powerful minister and probably the timely death of the Cardinal preserved him from a worse fate, for Wolsey, as you all know, died at Leicester on his way to London to be tried after a fashion and no doubt executed.

He was left in a pauper's grave and in a few years the Abbey Church of Leicester was plundered and made desolate. The Cardinal's last resting place was forgotten and the sumptuous tomb which he had prepared for himself lay untenanted at Windsor. The centuries rolled slowly forward. Drake was buried at sea. Marlborough and Chatham each lay in his own place and the monument remained empty. At length when a triumphant, though a mourning nation desired to honour its most glorious dead, the destined occupant had come. The sarcophagus was moved to St. Paul's and was placed beneath the dome in a crypt, to whose perfect silence the unceasing roar of London cannot penetrate. In that speaking, that impressive silence, with the highest achievement of English Architecture for his canopy, Nelson sleeps within the sepulchre of Wolsey.¹

Reports of Cases.

A CASE OF CHRONIC LENTICULAR DEGENERATION.

By W. L. MACDONALD, M.B., Ch.M. (Sydney),
Resident Medical Officer, Royal Alexandra Hospital for
Children, Sydney.

THE following patient, R.S., aged twelve years, was recommended for admission to the hospital by Dr. A. W. Campbell on August 30, 1927.

The patient was third in the family. A sister, aged sixteen, is living. One sister died at six months of age of "summer complaint." The patient has lived in the country all his life. He had a normal birth and infancy and he was a bright healthy boy until about four years of age, when a slight stutter was noticed. This disappeared. When five years old he injured a finger in a machine and this accident seemed to precipitate trouble in speech again. From this date his present disabilities have gradually progressed. His mother describes "a stoppage in his speech," stiffness of his muscles, particularly those of the right arm and leg and a peculiar gait. He is mentally backward.

On examination the patient is seen to be a well developed boy. He lies quietly in bed and quickly grasps what is said to him, but his articulation is difficult. He makes an obvious effort to answer questions at once then replies after an appreciable pause in as few words as possible. His speech is explosive. He is unable to read or write, but recognizes familiar objects. His amusements are those

of a child of five and he is emotionally somewhat unbalanced. His head is slightly smaller than normal. There is definite spasticity of the arm and both legs more particularly the right. He walks in a stiff fashion with a wide base, but never stumbles or falls. There is a coarse tremor of the arm and leg more pronounced on attempting a voluntary movement. Muscular development and muscle power are good. The pupils are equal and react to light and accommodation. The knee jerks are present and not exaggerated. The plantar reflex is flexor. No ankle clonus is present. Abdominal reflexes are absent. The cremasteric reflex is present. He has control of his sphincters. Sensation is normal, nothing abnormal is detected in heart, chest or abdomen. A diagnosis of progressive lenticular degeneration has been made.

Comment.

The following characteristic features are present:

1. Onset early in life.
2. Involuntary choreiform movement.
3. Spasticity.
4. Emotional disturbances and mental weakness.
5. Difficulty in speech.

It is said that there is invariably some degree of hepatic cirrhosis in these cases, but no symptoms or signs of this condition have been observed in the patient under discussion. Wilson suggests that the degeneration and cavitation found in lenticular nuclei and internal capsules have been caused by the selective action of some toxin produced by abnormal liver metabolism.

Acknowledgment.

I am indebted to Dr. A. W. Campbell for permission to publish these notes.

RETROPERITONEAL HYDATID CYST WITH EROSION OF THE LEFT COMMON ILIAC.

By C. CRAIG, M.D.,
Surgeon Superintendent, Launceston Public Hospital,
Tasmania.

THE patient was a man aged fifty-five. Twenty-one hours before admission he was awakened from his sleep by a sudden and severe pain in the left side. The severe pain lasted for ten minutes, but the patient had pain bad enough to keep him awake all night. Ten hours before admission he had another sudden and severe attack of pain lasting about half an hour. The pain continued as an ache all day. He had not vomited or felt sick. His bowels had opened on the previous evening. There had been no abnormality of micturition. There was no history of dyspepsia.

On examination the patient was found doubled up with pain and declaring he was going to die. His face was ashen, he was perspiring freely and the extremities were cold. His temperature was 36.1°C. (97°F.), his pulse rate 96 and his respiratory rate 20 in the minute.

On the left side of the abdomen, occupying both upper and lower quadrants, was a large diffuse mass, very tender to the touch. The muscles were on guard over it. The mass was dull to percussion. Liver dullness was greatly diminished. Operation was ordered, but the patient's condition became rapidly worse and he soon died.

Post Mortem Examination.

On opening the abdomen there was a small amount of fresh blood in the peritoneal cavity. On the left side of the abdomen there was a huge clot of fresh blood underneath the peritoneum covering the descending colon. The colon was lifted up by the clot. On scraping out the clot, large numbers of daughter cysts were come across and there was revealed a large oval mass, eight centimetres by seven centimetres, situated over the edge of the pelvis. The wall of the mass was very closely adherent to the

¹ Galton's "Life of Thomas Cromwell."

parietes. On dissection the common iliac artery was found to be closely adherent to the inner side of the mass. The mass was then opened and found to be a cyst containing many daughter cysts and fresh blood clot. On emptying it, it was found that the cyst had eroded the wall of the artery and that this had burst, first apparently into the cyst, the cyst then bursting and allowing the escape of blood under the peritoneum. No cyst was found in any other organ.

MELÆNA NEONATORUM.

By R. F. MATTERS, M.B., B.S., D.G.O., F.R.C.S. (Edin),
Adelaide.

ABOUT four days after birth a male child developed marked melæna. There was no history which was that of true hæmophilia, although the mother and her father appeared to bleed very readily, so that this case was probably of hæmorrhagic diathesis.

The amount of blood lost was considerable, about ten napkins being well saturated in about twelve hours. Some blood was bright, but mainly tarry. The infant developed a marble like appearance and had no strength even for taking the breast.

An attempt was made to inject some maternal blood into the sagittal sinus, but as the pressure was insufficient for blood to flow through the needle, ten cubic centimetres of maternal blood were injected into the glutei followed later by another ten cubic centimetres. "Hæmostatic serum" was also given later under the scapula; this appeared to stop the hæmorrhage completely and the baby was kept in an improvised incubator. By the end of twelve hours the melæna had almost ceased. The baby was given breast milk in a nipple shield fed by a pipette for three days and finally recovery was complete.

TWO CASES OF TORSION OF THE FALLOPIAN TUBE.

By C. E. CORLETTE, M.D., Ch.M.,
Senior Honorary Surgeon to the Sydney Hospital, Lecturer in Clinical Surgery, The University of Sydney.

ACUTE torsion of the Fallopian tube appears to be a very rare condition. From time to time an occasional case is recorded in the journals, but the total is very small. It has, however, been my lot to have operated on two patients. Both had serious symptoms, and both could be described as examples of what is usually called, in medical slang, "acute abdomen." Each one was very different from the other. The following descriptions are from the clinical notes of my cases.

CASE I. Acute volvulus. Mabel P., aged twenty, unmarried, fell and twisted her right foot while skating on September 1, 1919. She was admitted to the Sydney Hospital, and X ray examination showed a fracture of the tip of the medial malleolus. The limb was put up in back and slide splints, and on September 11, it was put up in a starch plaster. All went well until 2 p.m. on September 21, when she felt a pain in the left side of her abdomen, and vomited. Next day, the pain was felt across the abdomen, and she vomited bile-stained fluid. The temperature and pulse remained normal. On September 23, her temperature was 38.5° C. (101.4° F.), her pulse 108, and her respirations 24. Next day, September 24, the notes state that the temperature was 38.7° C. (101.8° F.), and there were pain and tenderness in the right iliac region, and pain on palpation in the right fornix. On that date I operated, first making a small incision over the appendix. Free fluid escaped, and a large mass was felt medially. The first incision was then closed, and the abdomen was opened by a mid-line incision. The mass was found to be an enormously distended left Fallopian tube, reddened and twisted clock-wise three times. It was typically a volvulus. The tube was untwisted and then

removed. The ovary was not involved in any way, and showed no signs of disease. The appendix, which was adherent at its base, was then removed, and the abdomen closed. Convalescence was uneventful, and she was discharged on October 20. The specimen was sent to the pathological department, but appears to have been lost.

CASE II. Simple torsion. Mrs. R.R., aged forty-nine, was admitted to the Sydney Hospital at 9.30 p.m., August 12, 1922. She had previously been quite well, but on the day of the admission she was seized with acute pain in the lower part of the abdomen, with vomiting. On admission, her pulse was 110, her temperature 37.4° C. (99.4° F.), and her respirations 28. There was some muscular rigidity in the lower part of the abdomen, particularly on the right side. She was very obese, weighing one hundred kilograms (sixteen stone) and had been operated on (cholecystectomy) some years previously for gall-bladder troubles.

Though appendicitis was suspected, there was considerable doubt as to the diagnosis. She was operated on the same night, the incision being made in the mid-line, below the umbilicus. The appendix was found to be elongated, but not inflamed. A cystic swelling was felt in the pelvis, and this was found to consist of a greatly distended Fallopian tube. It was, in fact, an acute hydrosalpinx. It looked like a large sausage, and lay more or less longitudinally in the pelvis, to the right side of and behind the uterus, the fimbriated extremity being pointed downwards. At the uterine end the tube was twisted right round. It was not adherent to the surrounding parts. The distended tube was removed by clamping and ligating the broad ligament, and by separating the tube from the uterine cornu. The right ovary, enlarged and cystic, was also removed. On the left side a large intraligamentary cyst was shelled out and removed. Finally, the vermiform appendix was removed. The abdomen was then closed. Convalescence was complicated by an attack of broncho-pneumonia, beginning two days after the operation. This subsided in about two weeks, and she left hospital quite well five weeks after the operation.

The pathological report on the specimen by Dr. Keith Inglis was as follows:

Macroscopic. Thin-walled. Fluid contents. Measures 12 x 9 x 9 centimetres. Distal end three centimetres diameter, tapering to uterine end. Probably a fimbrial cyst leading to obstruction of abdominal ostium of tube with subsequent hydrosalpinx. Kept as a museum specimen.

I leave these cases on record without further comment than to say that I have seen cases of torsion of the Fallopian tube recorded wherein it was assumed that they were cases of torsion of a hydrosalpinx, the hydrosalpinx being primary, the torsion secondary. I am quite certain that in the first case the hydrosalpinx was secondary to the torsion. It seems very probable, though not absolutely certain, that in the second case, as in the first one, the torsion was primary and the hydrosalpinx secondary.

Reviews.

GASTRO-INTESTINAL DISORDERS.

THE fourth edition of "Diseases of the Digestive Organs" by Charles D. Aaron, Professor of Gastro-enterology at the Detroit College of Medicine and Surgery, is a wonderful, if unimaginative, encyclopædia of gastro-intestinal lore.¹

According to the preface the plan of the work, as before, follows the physiological path of the digestive tract, beginning with diseases of the mouth and taking up in succession the pharynx, œsophagus, stomach, liver, gall-bladder, bile-ducts, pancreas, small intestine, appendix, caecum, colon, rectum and anus.

A good deal has been added since the third edition appeared in 1921, so that the work is fairly well up to

¹ "Diseases of the Digestive Organs with Special Reference to Their Diagnosis and Treatment," by Charles D. Aaron, Sc.D., M.D., F.A.C.P.; Fourth Edition, thoroughly revised; 1927. Philadelphia: Lea and Febiger. Royal 8vo., pp. 927, with illustrations. Price: \$11.00 net.

date, but there is a curious lack of reference to the work of the Guy's Hospital and other English schools which have produced such excellent work in the last few years, particularly with regard to diathesis and the normal variation in the various tests.

There are some excellent chapters, full of useful knowledge on methods so often neglected and of which, indeed, the practitioner is often quite ignorant. So commonly textbooks dealing with treatment contain such statements as "massage and electricity are useful," "hydrotherapy may help" and so on, without giving the least indication as to when and how these methods should be applied. Aaron, however, has clearly indicated their uses by special chapters on massage, electricity, hydrotherapeutics and mineral waters. There are also special chapters on diet in gastric diseases, diet in intestinal diseases, medication in gastric diseases and medication in intestinal diseases. These, with a chapter on X ray examinations and another on special tests for gastric, duodenal and intestinal functions, form the first half of the book, before the special diseases of each part of the alimentary tube are touched.

Although a mine of information about useful and useless methods and excellent for reference, the book is hardly one to be recommended for students or for giving anyone a clear idea of the interrelation of gastro-intestinal diseases and their relation to disease elsewhere in the body. The sections on physiology are out of date and those on aetiology and pathology poor. There is no attempt to classify the perverted functions of the tract and so to give a clear idea of how they arise. Thus we know that almost all the symptoms of gastro-intestinal dysfunction are of muscular origin, a point so commonly misunderstood, for example, pain, hunger, nausea, anorexia, sinking feeling. On perverted function again, such as hypermotility, depend most cases of hyperchlorhydria, while hypoaecidity, low values of pancreatic and other enzymes *et cetera* depend on an overdilution due to increased regurgitation from the intestine, as do also nausea, vomiting, dirty tongue *et cetera*, as shown by Alvarez. Aaron has failed to coordinate these various symptoms, to show how they arise or how they may be used to interpret and to give a clear picture of what is going on in the alimentary tract. Further, how disease elsewhere produces perverted gastro-intestinal muscle function, as shown by symptoms, is scarcely mentioned. If these facts were made clear, some meaning would be given to the excellent and elaborate laboratory and other methods of examination, most of which however nobody would ever use. It seems that many of these quantitative tests of secretions, enzymes *et cetera* are overdone, except perhaps in the case of the pancreas and that they would be of value only if the gastro-intestine were unable to accommodate or readjust itself to the absence of function of these glands.

Actually we find this readjustment all along the line, for example, achylia can exist with perfect health, since other parts of the tract can make up for the missing function. In gross disease of an organ some of the tests of enzyme strength *et cetera* are often of value, but generally other changes indicate sufficiently the seat of the trouble.

There are several serious omissions from the book, namely, that achylia occurs in normal healthy people and is in fact, a variety of normality, that achylia and other gastro-intestinal types run in families, hence the importance of diathesis and family history, the fact that achylia precedes pernicious anemia and often other ailments, the value of hydrochloric acid from the point of view of its general effect, the phenomenon of duodenal regurgitation and its effect on pyloric function, emptying and acidity, the interpretation of the fractional test-meal and the fact that it is really a record of gastro-intestinal function as a whole rather than a measure of secretion. The physiology of this book is that of twenty years ago. Finally there is no bibliography, a serious omission. We feel that there is too much space devoted to the suiting of diet, drugs *et cetera* to the new conditions found in disease, instead of the elicitation of causes. Perhaps this is the result of our poor knowledge of the pathological physiology of the non-organic dyspepsias.

On the other hand treatment is given very completely with full details of diets, a variety of drug treatments and prescriptions and the author is particularly good on the use of physical methods of treatment. Faecal examination is shown to have great scientific value, though it is doubtful whether it will ever be used as a routine method of diagnosis.

The book is excellently produced and well printed on good paper. It may be regarded as useful for reference purposes.

AURAL DISEASE.

Milton J. Ballin has published a sixth edition of "Politzer's Text Book of the Diseases of the Ear."¹ He states in a preface that he has "eliminated unimportant matter and substituted additions of more interest"; but we find included only one abstract from a publication of the year 1913 and that no other abstracts later than 1906 have been added. This seems a pity, as in the last fourteen years much has been published and many new forms of examination and treatment have been adopted. The chapters on anatomy and physiology are unchanged and, as before, the detailed descriptions are excellent. No mention, however, is made of the later researches in the physiology of the labyrinth, nor are modern methods of examination alluded to. Diseases of the external, middle and internal ear are fully described and as the symptomatology and diagnosis of aural diseases have not changed, the descriptions are adequate. The author leaves much to be desired in discussing treatment, for example in otosclerosis no work later than 1898 is reported. In the description of operative treatment for middle ear suppuration much space is given to intraaural operations such as ossiculectomy, division of adhesions which have fallen into disuse and no mention is made of the modified radical operation which has been adopted as of definite value in selected cases. No mention is made of electricity in any form, nor of X rays or radium as therapeutic agents. In a chapter on aids to hearing nothing later than the ear trumpet is mentioned. A small chapter on aural infections and life insurance is of value in that it gives clearly what conditions should not be accepted by an insurance company, and what can be regarded as an insurance risk. To sum up, Politzer's original descriptions of the anatomy, physiology and diseases of the ear have stood the test of time, but no new matter has been added to this edition to bring it up to date with modern knowledge and its publication does not seem justified.

THE CARE OF INFANTS.

"The Hygiene of Infancy," by Dr. S. T. Beggs, is arranged on the question and answer principle and is intended for health visitors, school teachers, teachers, social workers and mothers.² It deals with thirty different subjects spread over sixty-two pages and has the great advantage of conveying much information in everyday language.

The importance of obtaining the services of the family doctor is everywhere insisted on whenever any serious complications or difficult problems arise, but a family who makes use of the teachings of this book will find the bill for medical services greatly reduced owing to the emphasis laid on such matters as cleanliness, fresh air, sunlight and suitable feeding.

It is a book that can safely be recommended and one which, if widely read, would greatly improve the health of the community.

¹"Politzer's Textbook of the Diseases of the Ear for Students and Practitioners," by Milton J. Ballin, M.D., Ph.B.: Sixth Edition revised and largely rewritten: 1926. London: Baillière, Tindall and Cox. Sydney: Angus and Robertson Limited. Royal 8vo., pp. 799 with illustrations. Price 38s. net.

²"The Hygiene of Infancy: A Questionnaire for the Use of Health Visitors and School Nurses, Teachers, Social Workers and Mothers," by S. T. Beggs, M.D., D.P.H., M.O.H.: 1926. London: John Bale, Sons and Danielsson, Limited. Crown 8vo., pp. 62. Price 1s. net.

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Congress and the Federal Committee.

THE Federal Committee of the British Medical Association was established some fifteen years ago for the purpose of dealing with matters of common concern to the several Branches in the Commonwealth. Under ordinary circumstances the questions considered by the committee are submitted to it by one of the Branches. When the Federal Committee drew up the regulations of the Australasian Medical Congress (British Medical Association), it provided for the consideration of resolutions passed at sections of Congress. In April of this year we pointed out that the machinery of the Federal Committee was admirably suited to handle resolutions of this kind. It is true that the committee does not take action on matters that affect the several Branches individually or collectively until it has referred these matters to the Branches and has received the considered opinion of each Branch. The loss of time involved is of little consequence, for resolutions of sections of Congress are not likely to be of great urgency.

On February 10, 1927, eleven resolutions passed at meetings of six sections were read to a general meeting of the second session of the Australasian Medical Congress (British Medical Association) at Dunedin by the Honorary General Secretary, but the members present refrained from discussing them. Several of these resolutions were referred by the Executive Committee to the Federal Committee and were considered at the meeting of the latter body on September 29, 1927. Those that had special reference to New Zealand have presumably been considered by the New Zealand Branch. It will be noticed that in each instance the proposals were the direct outcome of a communication read before a section. They are all rational and eminently desirable proposals and as far as the medical profession is concerned they are not controversial. The advisability of instituting chairs of bacteriology

at our universities with medical schools will not be challenged. For many years the medical profession has opposed the registration of opticians as sight-testers on the ground of the public interest. Everyone interested in the welfare of the community will support the suggestion that facilities should be provided for the adequate training of public health nurses. The prevalence of hydatid disease in Australasia renders it imperative that special measures should be adopted to combat this disease. The proposals put forward from the Congress in Dunedin will receive universal approval. The proposals concerning the formation of councils of mental hygiene have been deferred pending the collection of fuller information on this subject. Lastly the suggestions of the Section of Naval and Military Medicine and Surgery that the number of papers to be read at the meetings of this section should be reduced and further that there should be a staff ride at all future sessions of Congress will meet with no opposition. The Federal Committee considered that the Executive Committee of the forthcoming third session of Congress would be the proper body to deal with the last two questions.

It is possible, however, that at some future time a contentious recommendation may be sent from a section of Congress to the Federal Committee. The committee will know how to deal with it, provided that it is a matter that can be referred to the Branches. It rests with the Council of each Branch to decide whether or not it will convene a general meeting and thus ascertain the opinion of the majority after full discussion. The task of the Federal Committee is easy if each member is in a position to report the decision arrived at by the majority of the members attending a meeting at which the matter was debated. The British Medical Association is constituted on democratic principles and its policy is determined by the Representative Body after each representative has had an opportunity of receiving instructions from the members of his Division. The immense areas of the Branches in Australia and the difficulty experienced by members residing at a considerable distance from the centre militate against the full application of the democratic principle. Moreover, it is not always

possible for the Council of a Branch to refer a matter to a Branch meeting at a sufficiently early date to enable the members of the Federal Committee to convey the decision to the next meeting of the committee. As long as the sections of Congress will restrict their recommendations to matters that do not involve a new policy and that are not concerned with the general relations of the medical profession to the community, no exception can be taken to the practice. But if matters of medical politics of general application are made the subject of resolutions of sections, the Federal Committee will experience far greater difficulty than it has yet experienced. It would be wise if the executive committees of the successive sessions of Congress took steps to prevent members attending the meetings of sections from attempting to transform a scientific conference into a political institution.

Current Comment.

THE TREATMENT OF VARICOSE VEINS BY INJECTION.

ONE of the most noticeable features of varicose veins is the fact that disability does not vary directly with the degree of varicosity. A patient with but a moderate varicosity may complain of constant inconvenience and even of continuous and severe pain when in the upright position, while another with a much more extensive and severe varicose condition will perhaps be able to follow his daily avocation without complaint. It thus follows that drastic measures, such as surgical removal, are not always called for. Many a patient is able to lead a comfortable existence with the aid of an elastic stocking and on the other hand operation in the more diffuse and severe forms is not always either possible or satisfactory. There is no denying the fact that surgical removal of varicose veins is often attended by brilliant and lasting results, but there are certain disadvantages.

Varicose veins occur frequently in persons who have to stand a great deal and who are dependent for their livelihood on their bodily exertions. Surgical operation for these individuals entails loss of time and of wages. Moreover, operation is not free from danger; septic infection may result in a phlebitis and embolism as a sequela is not unknown. There is an urgent need for another method of treatment which must be both simple and safe and which will occasion but little loss of time for the sufferer during treatment.

An attempt was made by Tavel in 1904 to obliterate varicose veins by the injection of a 5% solution of phenol. Although he achieved a certain measure of success, little notice was taken of his work and it

remained for French investigators, Sicard, Paraf, Gaugier and G  n  vri  r to resuscitate the injection method of treatment and to advocate its general use. It is obvious that for a solution to be regarded as suitable for this purpose it must not only bring about obliteration of the veins, but must be capable of use without the production of toxic effects. Paraf and Sicard found that the obliteration of veins in the course of treatment by the intravenous injection of certain arsenical preparations was due to an excess of soda in the solution and did not occur when neutral solutions were used. This led them to use bicarbonate of soda for varicose veins. They found that, although it was a satisfactory sclerosing agent, it was too irritating to the subcutaneous tissues and the tissues surrounding the vein. They experimented with other solutions and finally settled on salicylate of soda. They found that a 20% solution fulfilled all the requirements. Among the other substances which have been used are the salts of quinine and G  n  vri  r was responsible for their introduction. Alexander who follows the practice of Sicard and Paraf states that the salts of quinine are much too caustic for use in the treatment of varicose veins, but the opposite view is held by A. H. Douthwaite.¹ Douthwaite has published a small book on the subject. It is really an extension of a short article which was published in *The British Medical Journal* of September 25, 1926. The solution employed by him is that recommended by G  n  vri  r and is composed of quinine hydrochloride, four grammes; "Urethane," two grammes and distilled water, thirty cubic centimetres. The preparation can be boiled and on account of the high concentration of quinine present it possesses strong antiseptic properties. Not more than one cubic centimetre is injected on the first occasion and if no untoward symptoms occur, two to three cubic centimetres may be used for subsequent injections. Douthwaite points out that it is occasionally of value to employ perivenous administration in dealing with large isolated dilatations, for these sometimes resist the sclerosing effect of the injections administered intravenously. The immediate effect of intravenous injection varies according to the size and position of the vein treated. In large dilatations not situated over bony surfaces no immediate effect is seen and the patient feels no pain. If the vein is small or thin walled, an immediate reaction is observed and the vein may swell to three or four times its normal size. This turgescence passes off in a few hours. Irritation of the endothelium is produced and there follows a deposition of fibrin which covers and adheres firmly to the entire irritated area. Quinine thrombi are held by Bardy to cling strongly to the walls of the vessel which are permeated by a bloody gelatinous mass. Later on organization takes place and sclerosis occurs. Chemical venitis is held by Douthwaite to be different from infective phlebitis in that it is superficial, definitely limited in extent and accompanied by a firm thrombus. Douthwaite

¹"The Injection Treatment of Varicose Veins," by A. Douthwaite, M.D., M.R.C.P. (London); 1927. London: H. K. Lewis and Company, Limited. Crown 8vo., pp. 47. Price: 3s. net.

also holds that if due precautions are taken, constitutional effects are rarely manifested. He emphasizes the statement that this form of treatment is well suited for the treatment of hæmorrhoids. The fluid is introduced into the submucous tissue at the base of the pile. The immediate effect is the production of œdema and this is followed by connective tissue overgrowth which strangles the veins. In other words the procedure is the same as that described in connexion with perivenous infiltration for veins of the limbs.

Such is the technique of the injection treatment of varicose veins. It is held that there is no necessity for the patient to be confined to bed. He is able to continue his work and need make no difference with the usual routine of his life. The economic importance of this is great. It is interesting to consider the reason why the injection of quinine into a vein produces sclerosis of the varicose portion and not of the other veins in a limb. Douthwaite states that normal veins are as a rule unaffected by the solutions which produce thrombophlebitis in varices. This may be due either to an altered condition of the wall of the vein or to an altered condition of the circulation or to a combination of both. Douthwaite devotes his attention to the condition of the circulation. In a large mass of varicose veins the circulation will be much slower than in normal veins. Jantzer came to the conclusion that there is an inversion of the direction of blood flow in varicose veins. He claimed to have demonstrated this by radiography after the injection of strontium bromide. Sicard, however, after using "Lipiodol" in the same way in a limb in the horizontal position reached what appears to be a more correct conclusion, that the flow is centrally directed, but that it is very slow. Sicard found that no "Lipiodol" passed into the deep veins. This is not surprising, because the deeper veins are supported by the tension of the muscles and this tension in movement of the limb is an important factor in the venous circulation. Mention has been made of the wall of the vein. The walls of varicose veins may become very thin as a result of their dilatation and the question may well be asked whether the endothelium in these circumstances is as resistant to the irritant action of a foreign material as is the endothelium of a normal vein. Another factor which has not been mentioned, is the question of dilution. The quinine at its point of entry will be in a concentrated form and will produce its effect in the slowly moving stream of a varix. As it moves onward, it becomes more dilute and will have no effect. Douthwaite refers to a statement "made by a doctor who had had sodium salicylate injections into extensive varicose veins, that the burning sensation following the introduction of the solution always travelled down the leg." Then he adds the following: "Herein lies the safety of the treatment which is still regarded by many as one fraught with grave risk." It is not justifiable to adduce as evidence the subjective sensations of any individual, be he medical practitioner or not.

Douthwaite is not alone in his advocacy of the injection treatment of varicose veins. He points

out that G n vri r has given 4,000 injections without fatality. Meisen, of Copenhagen, has published satisfactory reports and Alexander in England has had similar success.

So far as we can discover, no experimental work has been carried out on this subject. The evidence is mainly clinical. It has yet to be shown that a solution of quinine introduced into a normal vein or even arteriole will not produce clotting and more evidence is needed in regard to the immunity of the deeply situated veins. It may be presumed that clotting occurs, but there is no satisfactory evidence that the clot is of such a character that embolism will not occur. The fact that several thousand injections have been made without calamity is highly suggestive of the safety of the method, but is not wholly convincing. Experimental investigation on this subject is needed. So far no reports of treatment along these lines have been received from Australian practitioners. Promising as it may be, the method must be used with the utmost caution and with careful attention to detail of technique.

RICHARD BRIGHT.

On July 8, 1927, the centenary of the discovery of Bright's disease was celebrated at Guy's Hospital, London. The star of Richard Bright began to shine twelve months after the death of that other great clinician, Laennec, whose memory has recently been honoured throughout the civilized world. Bright's first publication was entitled "Reports of Medical Cases Selected with a View of Illustrating the Symptoms and Cure of Disease by a Reference to Morbid Anatomy." The centenary celebrations were initiated by a demonstration on the pathology of Bright's disease by the distinguished Professor of Pathology of the University of Freiburg, Ludwig Aschoff. Then followed a luncheon at which the Right Honourable the Earl of Balfour presided. Centenary gold medals were presented to Professor W. S. Thayer, to Professor Aschoff, to Professor Wid l as the representative of French medicine and to the widow of the late Ernest H. Starling. In the afternoon the "Bright Memorial Oration" was delivered by Professor W. S. Thayer, some time Professor of Medicine at the Johns Hopkins University. Thus Britain, France, Germany and America were joined in honouring the memory of one whose labours earned for him "a well-merited and honourable immortality." The "Bright Memorial Oration" is published in the combined July and October number of *Guy's Hospital Reports*, together with an account of the celebrations. This publication also contains a series of articles covering almost every phase of kidney disease. All the articles are by members of the hospital staff with the exception of two. Sir John Rose Bradford, President of the Royal College of Physicians writes on ur mia and *Professeur A. L mierre* contributes an article entitled: "*Les grands Syndromes du mal de Bright.*" This is a symposium of a comprehensive nature and of scientific value. It is thus a suitable memorial to the great physician of Guy's Hospital.

Abstracts from Current Medical Literature.

MEDICINE.

External Heat.

R. PEMBERTON (*Annals of Clinical Medicine*, February, 1927) discusses the physiological effect of external heat upon the human body. Sweating is the most noticeable effect of hot air or hot bath; sodium chloride (often several grammes a day), urea, ammonia, uric acid, creatin, phosphates and sulphates are excreted in the sweat. Apart from sodium chloride it is doubtful whether the skin can replace other excretory organs in ridding the body of excess of the substances mentioned. Heat increases the pulse rate; the effect on blood pressure is variable; in great heat the diastolic pressure falls and as a rule in normal persons cold baths raise the blood pressure, while hot baths lower it. Diuresis with increased output of urea and chlorides is noted, hyperpnoea occurs, the oxygen content of the blood rises and carbon dioxide falls. Lactic acid is excreted in the sweat, but there is no evidence that this acid occurs in greater quantity or is more largely excreted in "rheumatism" than in other conditions or in normal persons. Metabolism is increased and with the excretion of acids a relative alkalosis of the blood and tissue occurs. The exposure of small areas of the body to heat produces less pronounced systemic effects.

Vincent's Disease.

F. T. CODHAM (*Canadian Medical Association Journal*, May, 1927) describes the affections due to Vincent's fusio-spirillum. Infection of gums, mouth, tonsils, pharynx, larynx and middle ear may be due to this organism, it may also cause bronchitis, pneumonia, meningitis, appendicitis and enteritis and may infect wounds. This organism was found in 9% of medical students and nurses and in 26% of hospital patients, especially those with chronic debilitating diseases and in leucæmic patients; the gums were the usual site of its occurrence. Two organisms, a *Bacillus fusiformis* and a spirillum, are found. It has been suggested that these two forms represent different stages of development of the same organism. They stain readily with gentian violet. A necrosis of tissues occurs and a yellowish white membrane forms, leucocytic infiltration is scanty and pus is formed late. Gingivitis with or without stomatitis is the common affection; in about one patient in thirty the tonsils are affected, a crater ulcer being formed. This affection usually heals in three weeks without treatment; sublingual and submental glands may be enlarged. The gingivitis is generally chronic, but may be acute and cause foul ulcers with loosening and falling out of the teeth. Oral hygiene is the best treatment. Fowler's solution thirty cubic

centimetres (one ounce), wine of ipecacuanha fifteen cubic centimetres (half an ounce) and glycerin four cubic centimetres (one fluid drachm) form a valuable remedy when applied with discretion; alkaline mouth washes, tincture of iodine and other remedies have their advocates. Arsphenamin, given intravenously, may do good. Careful hygiene of the mouth and teeth is the best preventive.

Laryngeal and Pulmonary Tuberculosis.

FROM a statistical study of six hundred and forty-five patients with laryngeal tuberculosis treated at Bejlefford Sanatorium, Denmark, during twenty-seven years J. Graveisen and Godley (*Tubercle*, July, 1927) attempt to show how this complication and pulmonary tuberculosis mutually affect one another. They found that laryngeal tuberculosis occurred chiefly in the third stage of pulmonary tuberculosis with cavitation and contrary to some authorities that it was present with equal frequency in both sexes. As the laryngeal lesion improved or healed in a number of patients despite the persistence of tubercle bacilli in the sputum, they conclude that laryngeal tuberculosis is probably not of bronchogenic origin. No less than ninety of the patients had no laryngeal symptoms and the importance is urged of routine laryngoscopy in every case of pulmonary tuberculosis. They claim to show by tables that the activity and extent of the pulmonary disease are of greater importance in prognosis than the fact of the larynx being affected and as a corollary that pulmonary tuberculosis patients with laryngeal involvement treated by thoracoplasty did relatively better than those with uncomplicated pulmonary disease not so treated. Light treatment was extensively used for the laryngitis, giving results twice as good as when no special treatment was employed. By far the best results were obtained by a combination of light and collapse treatment, 51.3% being classified as treated under this régime, as against 16% subjected to light treatment only and 33% to collapse treatment only. In conclusion the writers affirm that close cooperation between laryngologist and physician will lead to even better results than those already obtained.

Collapse of the Lung.

L. R. SANTE (*The Journal of the American Medical Association*, May 14, 1927) discusses massive (atelectatic) collapse of the lung with especial reference to treatment. It is a rare condition, following trauma or operation as a rule. Immediately or after a few days' pain in the chest, dyspnoea, cough, fever to 38.9°C. (102°F.) or more and mucopurulent expectoration occur. The symptoms and signs may simulate pneumonia, but can be differentiated by the diminished size of the chest and approximation of ribs on the affected side, with evidence of the dislocation of the heart and mediastinal contents

towards the sound side. These appearances are revealed by X ray examination and a dense shadow involving one or more lobes is evident, the density being due perhaps to engorgement of capillaries and lymphatics. No evidence of bronchial obstruction is to be found and the cause of the collapse is not known. Rolling the patient on the sound side while he coughs has been followed by rapid filling of the affected lung with air in four cases described by Sante who actually observed the expansion of the lung under the screen. This expansion was not complete after several days and the right side of the diaphragm was still raised at that time. Change of position from time to time prevents further collapse and this procedure is suggested for prophylaxis after operations. The lung is not separated from the chest wall in this condition which has been attributed to vagal stimulation causing collapse of the bronchioles and consequent alveolar collapse.

Treatment of Hæmorrhoids.

K. SZEGO (*Wiener Medizinische Wochenschrift*, July 23, 1927) considers that the cure of hæmorrhoids can be effected without operation if care be taken to insure emptying of the venous system by breathing exercises. He places his patients on their right side with arms and legs flexed and with the right hand under the head. With the patient lying relaxed the first movement is inspiration, the abdominal muscles being used to the fullest extent. This is followed by prolonged expiration when the abdominal wall is firmly retracted and the left arm and both legs fully extended and their muscles kept contracted. At the same time the anal sphincter and perineal muscles are tightly contracted. The patient maintains this position as long as possible and then recommences with inspiration. After repeating this four or five times he is encouraged to contract the anal sphincter alone. Even with thrombosed hæmorrhoids improvement is soon noted and the oedema diminishes while the mass retracts. The author emphasizes the value of this method in all cases of atony of the perineal muscles especially when of central nervous origin. It is also of value as a prophylactic to phlebitis.

Globus Hystericus.

A. GLASSCHEIB (*Wiener Medizinische Wochenschrift*, July 30, 1927) maintains that globus hystericus is not always a manifestation of hysteria. Unless other stigmata are present, some different cause should be looked for, especially retrosternal goitre. It may also be due to a granular pharyngitis which is frequently an early symptom of pulmonary tuberculosis. Occasionally it is caused by myalgia of the sterno-hyoid and sterno-thyroid muscles. Some patients have an idiosyncrasy to vulcanite and a dental plate may be the cause of the symptoms. Another group with no physical signs of alteration of the pharyngeal mucous mem-

brane manifest evidence of paralysis of the glosso-pharyngeal nerve, similar to facial paralysis and also probably rheumatic in origin. Application of the faradic current to the neck or better, to the mucous membrane soon effects a cure.

Lead Line, Arteriosclerosis and Arterial Hypertension in Lead Workers.

MAY R. MAYERS (*The Journal of Industrial Hygiene*, June, 1927), discusses the findings relating to the lead line, arteriosclerosis and hypertension in three hundred and eighty-one lead workers examined by the Bureau of Industrial Hygiene, New York State Department of Labour. Physical examinations were made in twenty-three plants in fifteen leading industries in the State of New York. The workers were exposed to lead in the following forms: lead fumes, red lead paste, red lead and litharge dusts, dry and wet paints, dry and wet chrome colours, dry and wet pottery glaze, pig lead and metallic lead dust and white lead as such. All examinations were made in the plants so that the series includes no persons incapacitated by acute lead poisoning. There were, in all, among the three hundred and eighty-one workers examined thirty-one with a lead line in the gums or 8.1%. The typical lead line is frequently very difficult to demonstrate and must be carefully differentiated from blueness in the gums due to cyanosis. When this lead line is present, considerable care must be exercised in order to determine whether it is the result of active lead absorption at the time it is observed or whether it merely represents a storage of lead sulphide in the gums which had been deposited there at some previous time and which is at the time it is observed inert. Patients suffering from lead absorption may or may not present a lead line. Careful laboratory examinations both of blood and urine are required for a proper interpretation of the significance of the lead line in any given case. Eighty-six workers had arteriosclerosis. All of these however were men over thirty years of age, so that the actual percentage of arteriosclerosis based on the 227 men of this age group was in reality 37.8%. Taking into account such factors as age, duration of exposure and alcoholism, the present investigation is held to show two things: (i) that the incidence of arteriosclerosis is relatively high among all workers of the social and economic classes from which lead workers are recruited; (ii) that the part which prolonged exposure to lead plays in the production of this arteriosclerosis is questionable. There were ninety-eight cases of arterial hypertension. Of the one hundred and fifty-four workers who were thirty years old or under, 44 or 28.5% had hypertension. Of the two hundred and twenty-seven workers who were over thirty years of age, 54 or 23.7% had hypertension. Eliminating all those with a coexisting arteriosclerosis,

however, it was found that the percentage of hypertension was 22.7 in the younger group and 14 in the older group. The possible relationship between arterial hypertension and neuro-vascular constriction of the capillary circulation, as evidenced by pallor, was investigated. It was thought that the existence of such a relationship might account for the fluctuations in blood pressure which had been observed in lead workers and reported by Oliver. Pallor and active lead absorption both appeared to be more frequent among those workers having hypertension (without accompanying arteriosclerosis) than among those who had no hypertension.

Oleo thorax.

F. G. CHANDLER AND S. ROODHOUSE GLOXNE (*Tubercle*, September, 1927) describe the operation of injecting sterilized oil into the pleural cavity in man and laboratory animals. They name ten types of pulmonary disease in which oleo thorax may be indicated. Most of these are types in which it is desirable to keep the lung collapsed for some considerable time and in which artificial pneumothorax is unsuitable or impracticable. The other indications are in pleuro-pulmonary fistula and chronic empyema with failure of lung expansion; it may also be used as a means of preventing firm pleural adhesions. They describe the technique of intrapleural injection of oil in man and give as a clinical example notes of a patient who had pulmonary tuberculosis and diabetes. The induction of oleo thorax gave a very satisfactory clinical result, the patient gaining 12.6 kilograms (two stone) in weight in twelve months. In experimental tests, liquid paraffin, "Lipoidol," "Gomenol" in olive oil and paraffin wax were injected into the pleural cavities of normal rabbits. It was found that soft sterile adhesions were formed which could be easily broken down. "Gomenol" was also injected into the pleural cavities of tuberculous rabbits. In the resultant adhesions histological evidence of tuberculosis was found. From their experiments the authors conclude that the effects of intrapleural injections of these oils are harmless, but not bactericidal and that the probable path of absorption is along the subpleural lymphatics.

Hæmolytic Streptococci as Secondary Infection in Pulmonary Tuberculosis.

W. M. CUMMING (*Tubercle*, April, 1927) has found that of one hundred and nineteen patients suffering from pulmonary tuberculosis, twenty-two had in the sputum hæmolytic streptococci, indistinguishable from the ordinary hæmolytic streptococci of surgical practice. The occurrence of these organisms in the sputum has been shown to be related to a definite but limited extent, with the incidence of hæmoptysis and hectic fever and with the mortality. Of these one hundred and nineteen patients eighty-nine were shown to have in the sputum a streptococcus which the author terms *Streptococcus pseudohæmolyti-*

cus. This streptococcus bears a resemblance to *Streptococcus hæmolyticus*, but can be easily distinguished from it and from *Streptococcus viridans* by cultural and serological methods. The occurrence of *Streptococcus pseudohæmolyticus* in the sputum appears to have no prejudicial effect upon the outlook in a case of pulmonary tuberculosis.

Mechanism of the Gall Bladder.

L. R. WHITAKER (*The Journal of the American Medical Association*, May 14, 1927) records observations on the mechanism of the gall bladder and its relationship to cholelithiasis. The gall bladder discharges bile into the intestine after ingestion of food. The method and completeness of emptying are uncertain. The author states that the gall bladder of the cat can be shown fluoroscopically to remain filled with iodized oil for days if the cat be not fed; when fat is given there may be a flow of oil for ten or fifteen minutes, the gall bladder progressively decreasing in size. Again, gall stones were placed in the cat's gall bladder which was left flaccid; after recovery the gall bladder was observed fluoroscopically and no change was evident till the animal was fed, when some of the stones were expelled. Direct action of magnesium sulphate relaxes the sphincter of the common duct, but only slight emptying of the gall bladder occurs unless food is given, the latter causing complete emptying. These observations indicate that non-surgical drainage of the gall bladder by intraduodenal injection of magnesium sulphate is useless as a therapeutic measure. It has been further noted radiologically that the shadow of the gall bladder increases in density with decrease in size after food. In cats this change has been shown to be due to concentration of bile and actual inspissated concentrated bile has been found resembling gall stones. This result was obtained by cutting the sphincter of the common duct, feeding with egg yolk to cause emptying and concentration of the bile and then storing for some days; stasis of bile and inspissation occurred. From these experiments it is concluded that frequent or excessive feeding in human subjects may cause emptying of the gall bladder with inspissation of its contents without allowing time for the organ to refill with bile. The dry bile in the gall bladder in these circumstances would make a suitable nidus for gall stones to be formed. The author states that these experiments show that emptying of the gall bladder is due to muscular contraction of its coats following the ingestion of food, especially fats; that stasis due to overfeeding or frequent feeding predisposes to gall stones. He suggests as prophylactic measures that food should be taken at long intervals when hunger indicates good muscle tone in the intestine and gall bladder. The result would be satisfactory emptying of that organ with ample time for it to refill before the next meal and thus the stasis in the gall bladder would be avoided.

British Medical Association News.

SCIENTIFIC.

A MEETING OF THE VICTORIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Medical Society Hall, East Melbourne, on October 5, 1927, Dr. J. NEWMAN MORRIS the President, in the chair.

Preventive Medicine.

DR. JOHN DALE read a paper entitled "The Practice of Preventive Medicine" (see page 710).

DR. GERALD WEIGALL desired to thank Dr. Dale for his extremely interesting paper. He thought that cooperation between general practitioners and public health officers would be greatly facilitated if the regulations were less stringent and more vigorously carried out and illustrated his remarks with reference to cerebro-spinal meningitis, diphtheria and venereal disease.

DR. A. E. TAYLOR said it had been a treat to listen to Dr. Dale. He thought, however, that one important aspect had been overlooked by him and that was that public health and preventive medicine should be entirely divorced from political control. The railways had for years been under political control, but had been placed under the control of commissioners and he thought that the same should be done with public health.

SIR JAMES BARRETT had enjoyed very much Dr. Dale's address and appreciated the wide field it had covered. The remarks he had made about controlled public health experiments on large bodies of men during the Great War, had been very much to the point. In Egypt during the short space of three months the causation of pellagra had been definitely determined by the carefully controlled examination of a large number of Turkish soldiers suffering from the disease. The lowered resistance resulting from deficiency in diet had been well illustrated by the detailed examination of about two thousand Turkish soldiers suffering from a dangerous form of ophthalmia which had been shown to have been largely due to a nitrogen deficiency. In peace time the opportunity for handling such large series of cases did not often arise.

The preventibility of disease in war time was shown by the fact that in the Crimean War the vast majority of deaths had been due to disease and not to wounds, while in the late war the reverse had been the case.

He was entirely in accord with Dr. Dale's clear statement that cooperation between the general practitioner and the public health officials was the backbone of preventive medicine. In giving evidence before the Royal Commission on Health he had stressed the importance of this.

Public health was not a subject but an attitude of mind and he deplored the fact that students of medicine did not get more instruction on the principles of preventive medicine, particularly with regard to town planning and the provision of open spaces in large cities. The modern text book of medicine gave practically no mention of the important aspects of preventive medicine. He thought that a State medical service would be a calamity. The practising profession should be sublimated into an organized system for the prevention of disease. If the health officials would meet the general practitioners and discuss the problems of preventive medicine, a big step forward to the ideal of complete eradication of disease would have been made.

DR. WALTER SUMMONS had been delighted to hear Dr. Dale's address. Those who dealt with the communal aspect of public health should be whole time officers, but the general practitioner and even the specialist did a great deal of preventive medicine. The surgeon in removing septic foci was really practising preventive medicine. Public health officials and practising physicians were not becoming divorced from each other, but were becoming more and more associated.

He had begun his career as a public health officer and had felt at that time that he had been dealing too much with things and not enough with people. Now the tendency

was to pay more attention to the personal factor and to educate people how to live hygienically. He thought that the general practitioner should do more preventive medicine and not be disturbed because the public health officials had partly taken over treatment of tuberculosis and venereal diseases. A sub-committee of the Branch might be formed to establish cooperation between the general practitioner and the public health authorities.

As preventive medicine during the war had been spoken of, he would like to say that the successful issue of the campaign in Palestine during the recent war had been made possible owing to the work of the medical corps. Other campaigns, as that under Napoleon and in earlier periods had failed because malaria had so ravaged the troops that the army could not hold on the year round and had to retire before the warm season. Allenby had managed to do this thanks to the work of the Medical Corps and so he had conquered Palestine.

Colonel CHARLES A. COURTNEY said that Dr. Dale had shown in an inspiring manner how greatly the war had altered the outlook and methods of the scientific and official mind regarding this subject, especially in its community and personal aspects.

The war had rendered possible experiments in bulk and lessons of great value had been learned not only by the scientists, but also it was important to note by the great majority of the soldiers themselves.

After a continuous personal connexion with soldiers for the previous thirteen years, he could say with certainty that two lessons had been indelibly impressed on their minds. One was the fact that the man who had no training or special skill would be the under-dog all his life. It was delightful to find applicants for vocational training (whom he had examined in large numbers) all spontaneously voicing this aspect and incidentally the vocational training part of repatriation had been a brilliant success.

The second lesson was the value of sanitation. Gallipoli and the Jordan Valley and France *et cetera* taught priceless lessons to the men in the ranks as well as to those in the laboratories. There could be no doubt that there were thousands of preventive medicine missionaries in every State and with such helpers the public health leader had abundant reason for encouragement especially from the community point of view. But the chief difficulty lay in the personal aspect of preventive medicine. In general practice the main object was to cure the patients and to him after searching the health-histories of many soldiers, it seemed that the origin and beginnings of a patient's ill-health did not as a rule greatly interest his medical adviser. Men who had been in several public hospitals, would tell to each a different story, each correct in part perhaps, but seldom sufficiently so to give the medical attendant a fair chance to estimate the factors that had caused the departure from health, or to give complete guidance for future health of the patients.

In repatriation hospitals it was all-important to determine the origin of the patient's ill-health and it was illuminating to note in recently-diagnosed disease how insidious had been the development during many previous years of signs and symptoms that showed the presence of disease, but not its nature. The medical files of many men contained thirteen years continuous history. Some were trophies of personal preventive medicine; others, the reverse.

The difficulties of administration were particularly evidenced in dealing with pulmonary tuberculosis. In order to help financial propaganda some philanthropic organizations had so emphasized the misery and menace and the hopelessness of the disease that they had created a phobia that had made it difficult for the patient to obtain work, or even a house at times to live in and thus they had sometimes destroyed the morale of the patient. This was a calamity, especially to the non-soldier sufferer who had to earn in order to live. To the ex-soldier who suffered from chest disease there was a temptation to seek a diagnosis of tuberculosis, for then he got a much greater pension and more public help than was available for other disabilities of for non-soldiers.

All tuberculous patients risked hardships perhaps when officially notified to the health authorities and some soldiers had desired that such a diagnosis be not recorded in order to avoid this risk, even though they lessened their pension rights.

There was at least in the language of the day a gesture of sympathy toward public health in the granting of pensions for tuberculosis, as the special rates were limited to those patients who were certified as "not a menace to public health."

Dr. Dale's belief that a well directed advertising campaign by the British Medical Association would be welcomed by the public was probably correct. The public proved ready enough to be fooled by quack lecturers and they would probably appreciate sane and more balanced guidance. The public on the whole were not fools and appreciated most matters accurately when the facts were fairly put, but he believed they would rather be fooled than neglected. If the British Medical Association could add to the existing facilities for health propaganda it would meet with welcome recognition for the same reason that Dr. Dale's remarks that evening had been welcome—because they were informative, sound and showed a desire to help and to seek help.

No one could doubt that a health-conscience was needed, for the number of ill-nourished children seen even in the country districts suggested that corn-beef and picture shows were the staple of their upbringing.

Dr. A. P. DERHAM agreed with Dr. Weigall that the details of the public health regulations were difficult to apply and needed revision. Dr. Dale had ably stressed the possibility of reducing considerably the infantile mortality rate. He (the speaker) had had the opportunity of seeing on a large scale the striking reduction of infantile mortality which had followed the application of the elementary rules of hygiene by a competent staff of nurses and assistants. Any deviation from the normal in an infant could be soon detected and should be dealt with intelligently at once. The fundamental factor in reducing infantile mortality was education of nurses, mothers and medical men. He agreed with Dr. Dale that disease was to a large extent preventable.

Although he did not believe in self advertisement by medical men, he thought that they should do more in obtaining the confidence of the public and educating them in the principles of hygiene. It should be recognized, however, that the general practitioner was a very busy man and that if he were called upon to perform public health duties he should be adequately remunerated.

Dr. MARSHALL ALLAN said that in the realms of obstetrics and infant welfare the centre of gravity had shifted back to antenatal work. This should include the hygienic care and supervision of the mother not only during the period of pregnancy, but right from the time of birth. Throughout adolescence antenatal work was in this way closely associated with the work being done in the schools. He had frequently heard criticism directed against the health officers, but he thought that in some cases they were hampered by the practising profession. In parts of the State and in Queensland there was close cooperation between the general practitioner and the public health officials. Dr. Dale had stressed the necessity of educating the public and in Prahran under the direction of Dr. Fetherston this was already being done, well attended lectures being given.

In the bush nursing movement the results of cooperation between nurses and doctors had been very good, although all classes of cases, both normal and abnormal, had been attended. The infantile and maternal mortality rates had been very low and compared more than favourably with those seen in the metropolitan area.

The present system of notification of puerperal sepsis with the publicity attaching to it was not fair either to the hospitals or to the medical men. Until this was altered it would not be possible to obtain reliable statistics. He had listened with very great pleasure to Dr. Dale's address.

Dr. JAMES BOOTH did not agree that the public could be trusted to help the profession in matters of hygiene and public health. In England where vaccination was optional, very few children were being vaccinated. He thought that the Branch should take steps to prevent the passage of the bill to abolish compulsory vaccination. If all people could be educated to follow the hygienic rules relating to diet exercise and fresh air, there would be a great reduction in disease and a big improvement in the race. The physician would then either cease to exist or become an advisor or a parasite. The surgeon would always be needed as accidents would never be entirely eliminated.

Dr. R. H. J. FETHERSTON said that he had during the whole of his professional life been interested in public health. His experience had been that, with the exception of a few men who were almost outside the pale, general practitioners were keenly interested in and willing to help in public health work. What was lacking, however, was a leader who would direct and organize the health officers and the profession generally and he looked to Dr. Dale to do this. If he (Dr. Dale) were willing to lead, he felt sure that the profession would follow. He joined with the other speakers in congratulating Dr. Dale on his address.

Dr. J. NEWMAN MORRIS congratulated Dr. Dale for the able and interesting way in which he had presented a difficult subject. The discussion had centred chiefly around a criticism of the public health officials and the general practitioners and how their activities might be coordinated. The outstanding defect was in his opinion the absence of leadership. More was wanted than the mere drawing up of regulations. Education of the general practitioner on the principles of preventive medicine was necessary and so also was effective cooperation, but as yet no concrete scheme had been presented.

He did not think that more elaborate notification of disease and more detailed written instructions to patients and relatives would be of any value. The general practitioner had an intense dislike for clerical work.

Dr. Dale had given a fresh and interesting view point and also the creed of a public health official. He had shown the importance of diet and research, but it would be difficult to find time to apply them thoroughly. Antenatal work was being done better and would be done still better in the future. The prophylaxis of disease was most important, but the general practitioner looked for help as to how it could be done. How, for example could the common cold which was responsible for about 30% of the work of the general practitioner, be prevented? He did not think that it was of much use taking swabs and making other pathological and bacteriological examinations in people who had already become infected. Effective measures should be taken before this.

Another splendid ideal, put forward by Dr. Dale, which was pregnant with great possibilities, was the periodical overhaul of all members of the community. This might be possible on a small scale, but he thought that the work involved would make it impossible of general application.

It was necessary for somebody to translate ideals into some practical well organized scheme whereby the activities of public health officials and the general practitioners should be coordinated. He did not object to treatment of certain diseases by the public health officials and the profession was not afraid of the loss of income which would follow the more effective prevention of disease. The profession would respond well to any scheme which would enable it to do in an organized way the things it was already doing every day without imposing on it burdensome clerical duties.

He desired to thank Dr. Dale for relating his evolution as a disciple of preventive medicine. We would like him to join with the Branch in developing a public health scheme and to help in a well guided advertisement of principles rather than of persons.

Dr. Dale in reply thanked the various speakers for their contributions to a very interesting discussion. He had been very interested in the remarks of Dr. Morris who had, however, hinted that the carrying out of the principles enunciated by him (the speaker) was impracticable.

Dr. Dale, however, said that he could see no reason why the family doctor could not arrange to advise the families under his care on dietetic and hygienic rules and the prevention of disease and further to inquire and see if they were being carried out. Many families he felt sure would welcome such advice. He knew of a number of instances in which medical practitioners attended families on a contract basis as in the Chinese system and thought it an excellent plan.

If the advisability of periodic examinations, if not every year then every five years, were pointed out to the people and the lodges, he felt sure that they would see the wisdom of it and be prepared to pay for it. With regard to the irritating formalities mentioned by several speakers he would like to assure them that public health officers generally did not desire to be unreasonable or to insist on the carrying out of the letter of the law where it could not be justified. He would welcome the opportunity of meeting the medical practitioners in his district with the object of securing cooperation.

Advertisement was quite legitimate and indeed necessary for whole time officers, but was not practicable for part time health officers. He would like to thank those present for the way in which they had listened to him.

A MEETING OF THE WESTERN AUSTRALIAN BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held at the Children's Hospital, Perth, on August 17, 1927. The meeting which was held at the kind invitation of Dr. L. G. Male, the Medical Superintendent, consisted in a series of clinical demonstrations.

Erb-Duchenne Paralysis.

A male child, well nourished, aged five months, had been admitted on August 12, 1927. The parents gave the history that for three weeks prior to admission the child had displayed a disinclination to use its right arm and had screamed with pain when the upper arm was touched or moved. There was a history of possible injury to the arm by stretching at about this time. The child held the arm in a position suggestive of Erb-Duchenne paralysis.

X ray examination of the arms and shoulder girdle had disclosed the fact that there was a general rarefaction of the upper end of the right humerus, the epiphysis being intact. The appearance had suggested the presence of a low grade septic condition. An interesting feature in connexion with this case was that the mother and maternal aunt were both deaf mutes. The serum of the both mother and child had failed to react to the Wassermann test. The diagnosis lay between a metastatic septic condition and a syphilitic osteitis. The child had been given antisyphilitic treatment and the arm had been immobilized in an abducted position. When last seen on September 8, 1927, the child had gained in weight by 0.67 kilogram (one and a half pounds) and was perfectly comfortable and allowed the arm to be moved freely and she also moved the arm voluntarily.

Birth Injuries.

Two patients suffering from birth injuries of the upper extremity were demonstrated.

The first patient was three weeks old. In this child there was a fracture of the right humerus at the junction of the upper and middle thirds with excessive callus and involvement of the radial nerve.

The second patient was three weeks old and presented a typical Erb-Duchenne paralysis of right arm. X ray examination revealed the presence of a fractured right clavicle.

Both these patients were making progress with massage treatment.

Meningo-Myelocele and Exomphalos.

A female child, aged ten days, had been admitted to hospital on August 7, 1927, two hours after birth suffering from meningo-myelocele and exomphalos. The exomphalos had been tense and although the bowels were acting after three days there had been unmistakable signs of

obstruction. With some trepidation the sac had been opened under chloroform anaesthesia and found to contain the caecum, appendix and two or three inches of small bowel. The contents had been strangulated and plum coloured. The contents had been mobilized, the sac excised and the wound closed in two layers. Healing had taken place by first intention and the child had progressed favourably until the twentieth day. No operative treatment had been directed to the meningo-myelocele owing to the condition of the patient.

Secondary Acute Ethmoiditis.

A female, aged two years, had been admitted on May 31, 1927 suffering from facial erysipelas. Right orbital cellulitis had supervened and on June 8, 1927, pus had been evacuated by incision along the upper malar eminence. The condition had not, however, subsided completely and X ray examination had disclosed the presence of infection of the ethmoid cells. Pus had been evacuated spontaneously at the inner canthus and the condition had subsided. Further X ray examination on June 25, 1927 and again one month later had shown that the ethmoid cells were apparently clear.

Primary Ethmoiditis.

A female child, aged eight months, had been admitted on July 30, 1927, apparently suffering from a right sided orbital cellulitis. Proptosis of the eye had been present and chemosis pronounced. Nasal examination had suggested a focus in the ethmoid cells and this had been confirmed by radiological examination.

Dr. H. B. Gill had made a perforation and had curetted the cells by the nasal route and the condition had manifested very rapid improvement which was maintained. The child had been discharged on August 20, 1927, with no ocular disability.

Multiple Osteomata.

Two children, aged six years and seven years respectively presented multiple bi-lateral osteomata in regions of the elbows, wrists and knees. In neither case was much disability noted and the parent of one stated that there had been a gradual diminution in size of some of the tumours. In each instance the diagnosis had been confirmed radiographically and in neither was there any familial history.

Rickets.

A female patient, aged one and a half years, a Czechoslovakian, presented a typical picture of rachitic deformity with the "rosary" bowing of the legs *et cetera*. Owing to linguistic difficulty no history of the method of feeding had been obtainable.

Dr. Male said that it has been noted that a definite rachitic tendency was exhibited by many of the Southern European children arriving in Western Australia.

Pituitary Dystrophy.

A group of four patients illustrating some interesting pituitary dystrophies was shown.

Frölich's syndrome was exemplified in a male, aged eleven years. This boy stood 1.8 metres (six feet) high and weighed 88 kilograms (fourteen stone). He was pleasant, rather dull and childish. His external genitalia manifested infantile characteristics. For the previous three months anterior pituitary substance had been administered with the result that his mental lethargy had to some extent diminished while his weight had increased. Radiographic examination revealed his pituitary fossa as being smaller than normal and the anterior clinoid process more massive than usual.

A female child, aged ten years, presented a typical Frölich's syndrome and radiographic examination revealed no abnormality other than a small pituitary fossa.

A male, aged seventeen years, stood 97.5 centimetres (three feet three inches) in height and weighed nineteen kilograms (forty-two pounds). He was intelligent in appearance although his conversation and general demeanour were childish. The radiographic appearance of his pituitary fossa showed it to be extremely small and

bilocular in outline. The possibility of renal infantilism was raised in this case. The urine was, however, free from albumin on examination.

The most interesting member of the group was a male, aged one and a half years, who presented signs suggestive of extreme hyperpituitarism. He stood sixty centimetres (two feet) in height and weighed nineteen kilograms (forty-two pounds). His head and trunk were huge and his voice stentorian. His external genitalia were extremely large and his pubic and abdominal hair prolific. He was the youngest of three and the confinement had been normal. Until six months previously he had been apparently a normal infant and the above developments had manifested themselves in that period. Radiographic examination of his skull on three separate occasions had failed to demonstrate any tumour formation or any abnormality beyond the fact that his pituitary fossa was extremely small and surrounded by comparatively dense bony walls. The diagnosis lay between a cortical hypernephroma, pineal tumour and hyperpituitarism.

Multiple Malignant Tumours in an Infant.

Dr. F. J. CLARK showed a female child, aged two years, who had been subjected to removal of a tumour from the right parotid at the age of ten weeks. Examination showed this to be sarcomatous in nature. On December 16, 1925, the right eye had been enucleated as containing a possible secondary growth which was shown microscopically to be a glioma. The child had made satisfactory progress with no appearance of secondary growth until February, 1927, when she had come under observation again, this time presenting a large nœvoid swelling of the upper lip. This had been excised and microscopical examination had shown it to contain tissue resembling parotid gland in structure and regarded as sarcomatous. In May, 1927, the child had been treated by deep X ray therapy and at the time of the meeting was apparently well and putting on weight.

Ringworm.

Dr. J. F. MCGLASHAN demonstrated three patients suffering from ringworm who had been treated by thallium acetate. A single dose had been administered at the rate of eight milligrammes per kilogram of body weight. Epilation had usually been complete in from nine to twenty-one days. To date no untoward symptoms or complications had been observed and the results were very satisfactory.

Post-operative Adhesions in the Pharynx.

Dr. H. B. GILL also showed a child, aged nine years, who had adhesions between the soft palate and the posterior pharyngeal wall after tonsillectomy ten months previously. By means of a dental plate with plugs attached, fitting into the naso-pharynx, progress was being made in keeping the adhesions apart.

Obituary.

CHARLES HERBERT HILL.

The death occurred suddenly and unexpectedly on October 5, 1927, of Dr. Charles Herbert Hill, a man of great versatility and standing in his profession. He was well known and had many friends and acquaintances in Victoria, his native State, but more especially was he well known amid a wide circle on the goldfields of Western Australia.

He passed quietly away in his sleep at his residence at Roke, South Australia, a quiet sleepy little town, but renowned for its ideal climate and picturesque surroundings, as well as its facilities for sport, shooting and fishing. Here about two years ago he acquired a small property situated along side a chain of lakelets draining the surrounding country, finding an outlet to the ocean at Guichen Bay on which the town of Roke is situated.

Charles Herbert Hill was born at Geelong in 1860 and was educated at its grammar school, under the late

Bacekridge Wilson. He matriculated at Melbourne University, took his Bachelor of Arts degree and then proceeded to the study of law, but after two years of legal studies he found his life's vocation in the study of medicine. He was a keen student and a hard worker, for in addition to his own studies he coached for many months of the year, working sixteen hours a day. On completing his medical course he acted as junior medical officer to the Bendigo Hospital, as assistant to Dr. Colquhoun to whom he was fondly attached. He commenced private practice at Mildura, Victoria, when that town was in its infant stage. He there made many lifelong friends and in addition passed through a critical stage of his life, for he contracted enteric fever. This was not an unmixed disaster, for he made a complete recovery and when shortly thereafter he transferred to Coolgardie where enteric fever was endemic, he alone among the doctors there was immune and for a time worked single handed while his colleagues succumbed to the disease. He was one of the first medical practitioners on the gold fields and when Coolgardie was forsaken for Kalgoorlie, he proceeded there and entered into a partnership with Dr. Gibson, a partnership which lasted until the latter went to South Africa. At Kalgoorlie he had an immediate success and occupied a prominent position in the professional, social and business life of the community. He was a committee man and later chairman of Hannan's Club and acted on its committee until he left in 1907. Mr. Charles Cooper, now secretary of the Australian Jockey Club was then secretary of the Kalgoorlie Club and Mr. Kenway of the Victorian Racing Club was also on its committee.

Hill had a *penchant* for outback life and was always found on the skirmishing advance line of exploitation. From Kalgoorlie he proceeded to Taverton and remained there until the mines closed down. When this happened and the miners were thrown out of work, it was characteristic of him that he destroyed all the accounts he had prepared ready to send out—he had always a soft side for the miners. From Taverton he proceeded to Westoria for a year and from thence to Meekatharra where he remained until he retired and went to reside at Roke where he could pursue his favourite recreations of fishing and shooting. Remarkable in many ways, he was not least remarkable for his versatility in languages, for he could read, write and speak fluently and correctly French, German, Spanish and Italian. He had also a fair acquaintance with Dutch and Russian. He had also a great gift for figures and often amazed his friends by his ability to "square" any given number up to four figures without the aid of a notebook and pencil. He was an omnivorous reader and, having a retentive memory, had a ready store of anecdote. He never married and while his sister, Mrs. Sutherland, of Flame, Victoria, remained unmarried, she presided over his home in Western Australia. His final illness was short and he died away from kith and kin. He lies buried in Roke cemetery, one of the oldest as it is one of the best cared for in the State. He was tended during his final illness by Dr. W. P. Cormock, a brother practitioner resident in the district, to whom we are indebted for these notes.

SAMUEL CONNOR.

Dr. Samuel Connor, whose death occurred recently, was born at Stanyford, County Antrim, Ireland, on June 17, 1861. He received his early education at the Royal Academical Institution, Belfast. From 1876 to 1881 he was a student at Queen's College, Belfast, and took the degrees of Doctor of Medicine of the Queen's University, Ireland, and Master of the Obstetric Art of the Royal University, Ireland. He was then for a time a Resident Medical Officer first at the Royal Hospital, Belfast and later at the Belfast Hospital for Sick Children. After leaving this institution he became an assistant to Dr. McBride, of Gilford, till March, 1882, when at the age of twenty-one years he sailed for Melbourne in the steamship *Superb* and on arrival started in practice at Coleraine. He married in 1883 and

returned to Ireland for a seven months trip. He became a Doctor of Medicine of the Melbourne University. He took a very keen interest in all matters concerning the welfare of the community in which he lived and it was largely owing to his efforts that the township obtained its telephone service and water supply. He was for many years a Justice of the Peace and an elder of the kirk. He took a great interest in the church and Sunday schools, being Sunday school superintendent and session clerk of Saint Andrew's Presbyterian Church, Coleraine. On account of his age and the state of his health, he was unable to volunteer for active service, but he did valuable repatriation work. He was a member of the British Medical Association for over thirty years. The profession extends to his family its deepest sympathy.

The Reverend W. H. Steele writes: Dr. Connor's profession of course made him deeply concerned in the first place with the physical wellbeing of the community, but in addition it might well be said that he had also a deep seated concern with anything and everything that was for the good of all—materially, intellectually and morally.

Soon after coming here he recognized both the need and the possibility of a good water supply and for many years he seems to have given the powers that be no rest concerning this very important matter, in urging them to action, so it was a glad day in his life when about a year before his death the Coleraine water scheme was completed and the water was officially turned on.

He was keenly interested in the government of the country and was a hard working member of his party's association, doing his utmost to have the best candidates brought forward and returned. He had a deep concern for the general welfare of the whole State and especially its rural industries and was on several occasions a member of the "Reso" trips and he greatly enjoyed seeing the State at work. His last trip was to Canberra a fortnight before his end came. He was not well pleased with much of what had been done there.

University extension work was a great hobby of his and for a number of years he was the president of the local class, for which he was assiduous in beating up new members and in keeping the old ones up to their studies.

He was convinced that the church with its organizations and ideals was the best means for promoting the moral good of the community and it was to the church that he gave his best powers. Coming from Ulster he threw himself into the work of the Presbyterian Church here and he gave it his unstinted strength as working elder, as lay preacher and Sunday school superintendent. Recognizing that the future of the country is in the hands of the children of today, he was concerned to see how they might best be trained in religious truths and good morals. As a temperance propagandist he was anxious to lead the youth of today into principles of abstinence from what he considered one of the greatest dangers of the time.

He not only worked hard for the local church but was a frequent member of the church courts and was almost a permanent member of many of the church committees. He had been attending to this class of work in Melbourne only a week before his end came. Lately he had been talking about withdrawing from much of the work he had been doing, but when the call came it found him in full harness in every piece of work in which he was interested. He has left an ideal which many will find it hard to follow.

GEORGE HORNE.

We regret to announce the death of Dr. George Horne which occurred at Melbourne on November 14, 1927.

University Intelligence.

THE UNIVERSITY OF SYDNEY.

A meeting of the Senate of the University of Sydney was held on October 10, 1927.

The following degrees were conferred *in absentia*:

Bachelor of Medicine (M.B.) and Bachelor of Surgery (B.S.): Isobel May Brown, Maurice William Ginsberg, John Augustine Guinane, William James Beverley Sheehan and Brian Wellingham Windeyer.

Professor J. T. Wilson, of Cambridge University, was appointed to represent the University of Sydney at the Triennial Imperial Educational Conference to be held in London in July, 1928.

Permission was granted to Dr. A. H. Martin, Lecturer in Psychology, to accept the position of Honorary Director of the newly established Australian Institute of Industrial Psychology.

It was decided to accept with grateful thanks an offer from Dr. H. B. Pickerill, of Sydney, to loan to the Medical School Museum for an indefinite period a number of wax models and casts illustrating facial plastic surgery.

The following appointments were confirmed:

Dr. J. I. C. Cosh as Acting Lecturer in Clinical Medicine at the Royal Prince Alfred Hospital during the absence of Dr. Sinclair Gillies on leave.

Dr. H. Harpiss and Dr. A. C. Thomas as Honorary Demonstrators in Anatomy.

Dr. A. Holmes à Court as Examiner in Therapeutics and Materia Medica for the forthcoming Fifth Degree Examination in Medicine.

On the recommendation of the University Extension Board, the following gentlemen were appointed Lecturers under the Board for the Extension Lectures in Journalism: Mr. C. E. W. Bean and Mr. Farmer Whyte (History of Journalism); Mr. C. Brunson Fletcher and Mr. R. L. Dunbabin (Principles of Journalism) and Mr. C. B. Cockerill and Mr. T. W. Spencer (Practice of Journalism).

On the recommendation of the Committee of Selection, Professor T. D. B. Osborn, Professor of Botany in the University of Adelaide, was appointed to the Chair of Botany, rendered vacant by the death of Professor A. Anstruther Lawson.

On the recommendation of the Cancer Research Committee the following appointments were made:

Mr. W. B. S. Bishop, B.Sc., a research worker in Bio-Chemistry in the Department of Physiology, as Bosch Cancer Research Fellow in the place of the late Dr. J. M. Petrie.

Mr. R. K. Newman, B.Sc., as cancer research worker in Bio-Chemistry in the Department of Physiology.

Mr. E. S. Horning, M.A., M.Sc., of the University of Melbourne, as a research worker in Cytology in the Department of Anatomy.

On the recommendation of the Faculty of Arts, the Senate decided to amend the Matriculation Regulations by deleting arithmetical questions from the Lower Mathematics paper at the Matriculation Examination. This change will not, however, come into force before March, 1929.

SISTER MARSDEN TESTIMONIAL FUND.

It would be difficult to find a person whose life of unselfish devotion and service in the cause of humanity can claim higher recognition than that of Sister Marsden. Her thirty years' work at the Royal Hospital for Women at Paddington and elsewhere in the interest of the women and children of New South Wales and the survival of upwards of eight thousand babies through her loving care and skill and the loss of only three of the mothers surely speak for themselves. Through advancing years Sister Marsden will be obliged to give up her good work at no distant date and, being in receipt of comparatively small remuneration and with no pension rights attaching, a movement on her behalf has been launched having for its objective the raising of £1,500 for the purchase of a home where the good Sister may enjoy a well-earned rest for the remainder of her days among her many friends.

Sister Marsden's only child gave his life in France in the Great War and she has spent hers in unselfish and devoted service for others.

An appeal on behalf of one so worthy, it is confidently believed, will command the sympathy and help of all classes of the community. A list of subscriptions received is given below and further subscriptions will be gratefully received by the Honorary Treasurer of the fund, Mrs. B. Findlay, 18 Cooper Street, Double Bay, New South Wales.

	£	s.	d.
Nurse Fuller	20	0	0
Mrs. Maurice Symonds	17	17	0
Nurse E. Woodrow (first donation)	12	12	0
Dr. A. Aspinall	10	10	0
Elliott Brothers	10	10	0
Dr. Margaret Harper	10	10	0
Professor J. C. Windeyer	10	10	0
H. Minton Taylor	10	0	0
Nurse Lewis and Friends	5	10	0
Dr. Constance D'Arcy	5	5	0
Dr. Wilfred Evans	5	5	0
Dr. E. W. Fairfax	5	5	0
Dr. N. Farrar	5	5	0
Nurse Farquahson	5	5	0
Dr. John Harris	5	5	0
Dr. P. L. Hipsley	5	5	0
Mr. & Mrs. C. Luber	5	5	0
Mrs. Pattinson	5	5	0
M.C.	5	5	0
Nurse A. Reuss	5	5	0
Mr. & Mrs. Saul Symonds	5	5	0
Mr. & Mrs. Ralph Symonds	5	5	0
Matron Major West	5	5	0
Mr. & Mrs. W. C. Wilkinson	5	5	0
Mrs. S. M. Blain	5	0	0
Dr. H. G. Humphries	5	0	0
John H. Keys, Esq.	5	0	0
Miss M. Peele	5	0	0
Sister Stewart	5	0	0
Mrs. J. M. Dunlop	3	3	0
Dr. & Mrs. L. Fetherston	3	3	0
Mrs. Phillips	3	3	0
Mrs. S. Richards	3	3	0
M.M.	3	0	0
Mrs. & Miss Vickery	2	10	0
Mr. F. E. Bayliss	2	2	0
Norman H. M. Blain	2	2	0
F. R. Brown	2	2	0
Miss E. S. Colman	2	2	0
Dr. Brown Craig	2	2	0
Nurse B. Curtis	2	2	0
Dr. Andrew Davidson	2	2	0
W. G. Dixon	2	2	0
Mrs. J. Firth	2	2	0
Mr. Gelling	2	2	0
Miss M. G. Gillies	2	2	0
Sir Thomas Henley	2	2	0
Mr. & Mrs. H. A. Henry	2	2	0
Mrs. S. Hermann	2	2	0
Miss Holloway	2	2	0
Dr. Gordon Lowe	2	2	0
Nurse Nelson	2	2	0
Mr. A. L. Parker	2	2	0
Mr. B. F. Parker	2	2	0
Dr. A. R. Steven	2	2	0
Dr. B. W. Stevenson	2	2	0
Dr. P. T. Thane	2	2	0
Mrs. A. B. Triggs	2	2	0
Nancy C. Veitch	2	2	0
Miss F. H. Wark	2	2	0
Mrs. & Miss Wetherill	2	2	0
Nurse C. Flower	2	0	0
Mrs. Smith	2	0	0
Mr. Mackay & Miss Monkin	1	10	0
Mrs. P. Gordon	1	3	0
Matron Fiford	1	2	0
Mary Alcorn	1	1	0
Dr. Maisie Asher	1	1	0
Dr. N. D. Barton	1	1	0
Judge Bevan	1	1	0
Mrs. Russell	1	1	0
Dr. Chenhall	1	1	0

	£	s.	d.
Mr. W. Cooper	1	1	0
M. J. G. Crowther	1	1	0
Nurse Cunningham	1	1	0
M. C. Darvall	1	1	0
F. J. Dunlop	1	1	0
Mrs. Fanning	1	1	0
Mrs. Garland	1	1	0
Mrs. Graham	1	1	0
Mrs. Frank Green	1	1	0
Leila B. Godfrey	1	1	0
Dr. Hansman	1	1	0
Mrs. J. R. D. Henderson	1	1	0
Dr. Bruce Hittman	1	1	0
Mrs. S. J. Johnstone	1	1	0
Dr. Basil Jones	1	1	0
Mrs. R. T. Jones	1	1	0
Sister Jones	1	1	0
Mr. & Mrs. T. H. Jones	1	1	0
Mr. Phillip King	1	1	0
Isabel B. Lavarach	1	1	0
Mr. Phil Lazarus	1	1	0
Mr. Herbert Lee	1	1	0
Mr. G. G. Lindeman	1	1	0
Dr. Little	1	1	0
Nurse Lockyer	1	1	0
Miss Macgregor	1	1	0
Mrs. McBean	1	1	0
Mr. McElhone	1	1	0
J. McKinnin	1	1	0
Mrs. Packer	1	1	0
M. A. Robertson	1	1	0
Mrs. Rosenfeld	1	1	0
Mrs. E. J. Scholes	1	1	0
Mr. H. De Y. Scoffe	1	1	0
Dr. Ramsay Sharpe	1	1	0
Miss Sheen	1	1	0
Mrs. Steele	1	1	0
Mrs. Steigrad	1	1	0
Mrs. Strahan	1	1	0
Percy Spencer	1	1	0
Mrs. Wallis	1	1	0
A. B. Wilkinson	1	1	0
Mrs. Murray Will	1	1	0
Mrs. Bowman	1	0	0
Mrs. Dunlop, Senr.	1	0	0
Dr. Dunningham	1	0	0
Miss A. Friend	1	0	0
Friends	1	0	0
Beatrice Gardiner	1	0	0
Mrs. Gill	1	0	0
Mrs. Gordon	1	0	0
Mrs. Hindmarsh	1	0	0
Mrs. Kilby	1	0	0
Mrs. Helen McDonald	1	0	0
M.F.P.	1	0	0
E. L. Moss	1	0	0
Murray & Co., Ltd.	1	0	0
E. F. Nelson	1	0	0
Mr. T. E. Pearce	1	0	0
Mrs. W. H. Read	1	0	0
S. D. Ritchie	1	0	0
A. M. Robertson	1	0	0
H. A. Russell	1	0	0
Mrs. Scholer	1	0	0
T. W. Tancred	1	0	0
Mrs. H. M. Thompson	1	0	0
Matron Tullop	1	0	0
Dr. Christine Walsh	1	0	0
C. Irene Webb	1	0	0
Amy Williams	1	0	0
Eleven donations of 10s. 6d.	5	15	6
Forty-one donations of 10s.	20	10	0
One donation of 7s. 6d.	0	7	6
One donation of 7s.	0	7	0
Four donations of 6s.	1	4	0
Forty-four donations of 5s.	11	0	0
Stamps sold	23	10	0
Under 5s. each	2	13	0

Total to October 17, 1927 435 19 0

Corrigendum.

The Honorary General Secretary of the Second Session of the Australasian Medical Congress (British Medical Association), Dunedin, 1927, informs us that through inadvertence the name of Dr. C. A. Hogg, of Sydney, was omitted from the list of members of Congress.

NOTICE.

Professor W. S. Dawson will hold a clinical demonstration at the Psychiatric Clinic, Broughton Hall, Leichhardt, on Friday, November 25, 1927, at 2.30 p.m. Medical practitioners are invited to attend.

Books Received.

- A TREATISE ON MATERIA MEDICA AND THERAPEUTICS INCLUDING PHARMACY, DISPENSING, PHARMACOLOGY AND ADMINISTRATION OF DRUGS, by the late Rakhaldas Ghosh; Eleventh Edition by Biren dra Nath Ghosh, F.R.F.P. and S. (Glasgow); 1927. Calcutta: Hilton and Company; London: H. K. Lewis and Company, Limited. Crown 8vo., pp. 740. Price: 12s. 6d. net.
- MEDICO-LEGAL INJURIES, by Archibald McKendrick, F.R.C.S. (Edinburgh); 1927. London: Edward Arnold and Company. Demy 8vo., pp. 350 with illustrations. Price: 18s. net.
- DISEASES OF THE NOSE, THROAT AND EAR FOR PRACTITIONERS AND STUDENTS; Edited by A. Logan Turner, M.D., LL.D., F.R.C.S.E., with the collaboration of various writers; Second Edition, Revised and Enlarged; 1927. Bristol: John Wright and Sons, Limited. Royal 8vo., pp. 464 with illustrations. Price: 20s. net.
- HANDBOOK OF DISEASES OF THE EAR FOR THE USE OF STUDENTS AND PRACTITIONERS, by Richard Lake, F.R.C.S. (England) and E. A. Peters, M.D. (Canada), F.R.C.S. (England); Fifth Edition; 1927. London: Baillière, Tindall and Cox. Demy 8vo., pp. 328 with illustrations. Price: 12s. 6d. net.

Diary for the Month.

- Nov. 21.—New South Wales Branch, B.M.A.: Organization and Science Committee.
- Nov. 22.—New South Wales Branch, B.M.A.: Medical Politics Committee.
- Nov. 22.—Illawarra Suburbs Medical Association, New South Wales.
- Nov. 23.—Victorian Branch, B.M.A.: Council.
- Nov. 24.—New South Wales Branch, B.M.A.: Branch.
- Nov. 24.—South Australian Branch, B.M.A.: Branch.
- Nov. 25.—Queensland Branch, B.M.A.: Council.

Medical Appointments.

Dr. J. E. F. McDonald (B.M.A.) has been appointed Medical Superintendent, Hospital for the Insane, Ipswich, Queensland.

Dr. Horace Guest Barrett (B.M.A.) has been appointed Second Assistant Medical Superintendent, Hospital for the Insane, Goodna, Queensland.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser," page xviii.

BENEVOLENT SOCIETY OF NEW SOUTH WALES: Three vacancies.

COMMONWEALTH DEPARTMENT OF HEALTH, THURSDAY ISLAND: Medical Officer.

ROYAL HOSPITAL FOR WOMEN, PADDINGTON, SYDNEY: Resident Medical Officer, Junior Resident Medical Officer.

Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
	Australian Natives' Association. Ashfield and District Friendly Societies' Dispensary. Balmalm United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham Dispensary. Manchester United Oddfellows' Medical Institute, Elizabeth Street, Sydney. Marrickville United Friendly Societies' Dispensary. North Sydney United Friendly Societies. People's Prudential Benefit Society. Phoenix Mutual Provident Society.
NEW SOUTH WALES: Honorary Secretary, 30 - 34, Elizabeth Street, Sydney.	
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australasian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Hon- orary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members accepting appointments as medical officers of country hospitals in Queensland are advised to submit a copy of their agreement to the Council before signing. Brisbane United Friendly Society Institute. Stannary Hills Hospital.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Contract Practice Appointments in South Australia. Boooleroo Centre Medical Club.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (WELLINGTON DIVISION): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington. New Zealand.

Medical practitioners are requested not to apply for appointments to position at the Hobart General Hospital, Tasmania, without first having communicated with the Editor of THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, Sydney. (Telephones: MW 2651-2.)

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and booksellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rates are £2 for Australia and £2 5s. abroad per annum payable in advance.

B.D.H. VITAMIN PRODUCTS

As a result of recent research on vitamins, and of the practical adaptation of this research in the B.D.H. Laboratories, it is now no longer necessary to depend upon cod liver oil as the principal source of supply of Vitamins A and D.

B.D.H. Vitamin Products cover all requirements.

RADIOSTOL

(Irradiated Ergosterol)

Irradiation of ergosterol results in the production of Vitamin D, now available in ample quantities under the registered name of Radiostol.

The manufacture of Radiostol registers a new epoch. It is the first example of the production of a vitamin on a commercial scale by artificial means.

Radiostol possesses over 200,000 times the antirachitic activity of cod liver oil. It is issued in a highly-active solution of exact strength, and in tablets containing a definite weight of radiostol in combination with calcium glycerophosphate.

Of all the methods of presenting Radiostol the most convenient for every-day use is to incorporate it in the complete vitamin food

RADIO-MALT

Vitamin A—growth-promoting—is derived from a source which for the first time is being used as an accessory food.

Vitamin B—antineuritic—is contained in B.D.H. Malt extract.

Vitamin D—antirachitic—made by ultra-violet irradiation of Ergosterol—is prepared commercially for the first time by the British Drug Houses Limited, and is now available under the registered name Radiostol.

In it Radiostol is dissolved in a tasteless oil rich in Vitamin A, and this mixture is then combined with Malt Extract containing the antineuritic Vitamin B. Thus Radio-Malt contains all three Vitamins A, B and D.

Radio-Malt is ideal, therefore, for administration to children and invalids, particularly those with a predisposition to tubercular trouble. It is recommended also for use as a general food tonic in cases of anæmia and nervous breakdowns and in convalescence after severe illnesses such as influenza and pneumonia.

Radio-Malt is available through the usual channels, and is stocked by leading pharmacists.

The presence of optimum amounts of vitamins is guaranteed by actual growth-tests made in the B.D.H. Physiological Laboratories.

Literature on B.D.H. Vitamin Products, and physician's tasting sample of Radio-Malt, sent on request to—

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